

AGRICULTURAL CHEMICALS



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Fertilizer Solutions Meeting Report

Chemical Sales Clinic

◀ IMC Production Training Clinic

Eastern Entomological Society Report

Florida Agricultural Research Institute

Fertilizer Production Men Outline

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New Herbicides, Insecticides

Sulfur, an Essential Plant Food

1960 Subject & Author Index

AGRICULTURAL APPLICATOR SECTION

December 1960

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I'll carry
the
goods!"



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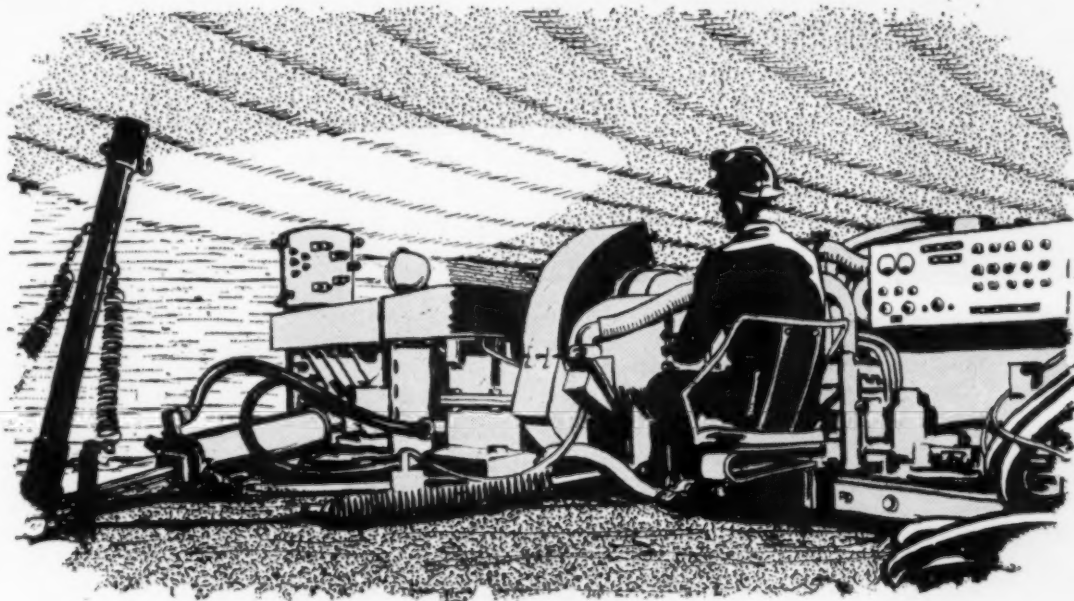
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This Month's Cover

Top Photo: Part of the group of fertilizer production men at IMC's Production Training Clinic look over various samples of potash specifications. See Story on Page 44.

Bottom Photo: Officers of the ESA (l. to r.): Executive secretary, R. H. Nelson; retiring president, M. P. Jones, U.S.D.A.; president for 1961, F. S. Arant, Univ. of Alabama; and president elect 1962, R. Glen, Canada Department of Agriculture. Elections were announced at the November 31, 1960 meeting of ESA in Atlantic City, New Jersey.

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DECEMBER, 1960



VOL. 15, No. 12

December, 1960

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1961...
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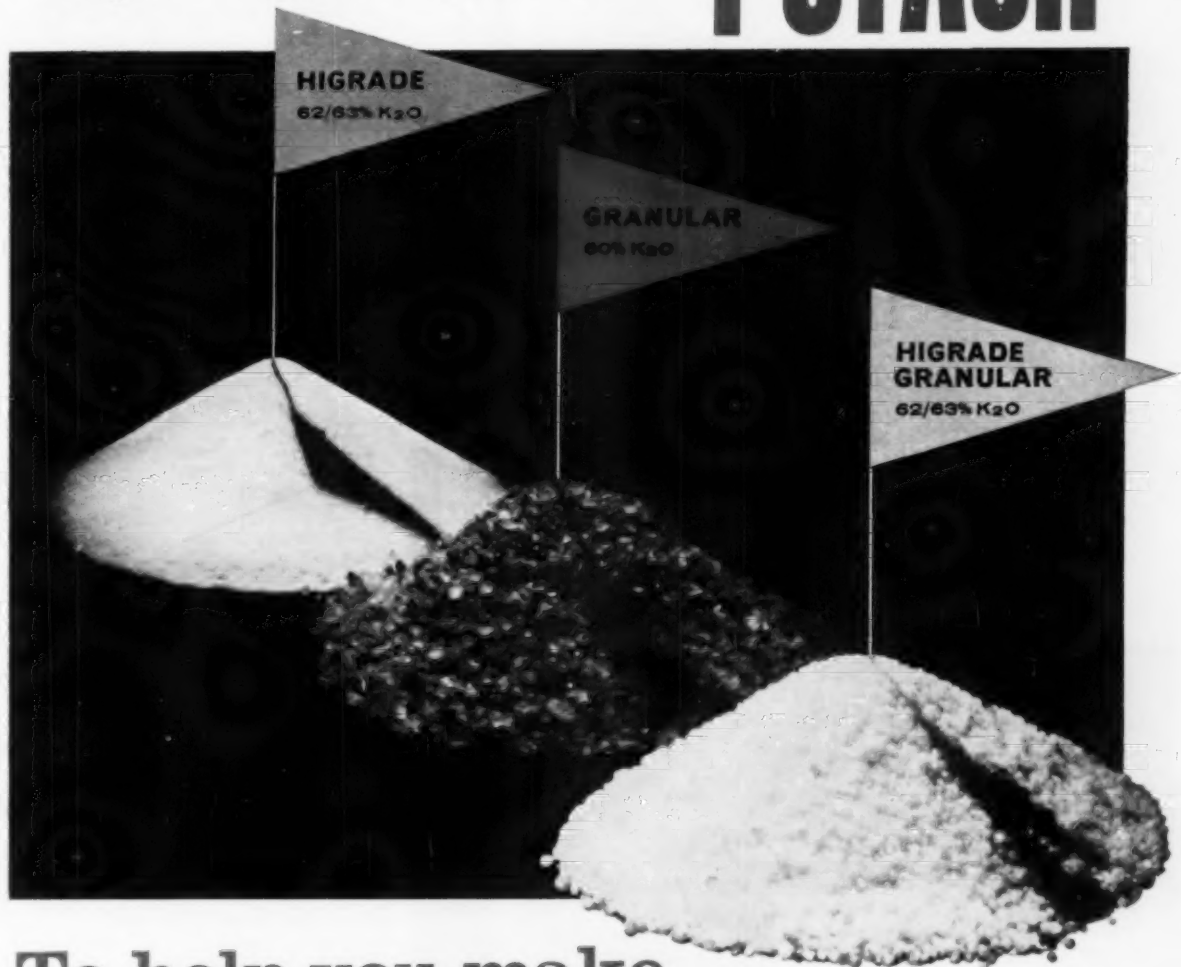
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## LETTERS to the EDITOR

### TO THE EDITOR:

The article entitled "Spray Controversy Hinders Efficient Control Operations" by Joseph A. Dietrich, which appeared on page 57 of your May, 1960 issue has been received here quite enthusiastically.

We would like to have your permission to reproduce the article and make it available to our entire sales force. If your permission is forthcoming, we will include any credit line you suggest.

A. J. Gerard  
John Bean Division, FMC  
Lansing, Michigan

I have read the article in the July issue of your magazine, on the "Dealers Role in Fertilizer Sales" by George M. Beal and Joe M. Bohlen. It was very good, and I have been wondering what you would charge for reprints of this article in quantities of 2000 and 4000.

Ivan E. Miles  
OLIN MATHIESON CHEMICAL CORP.  
Houston, Texas

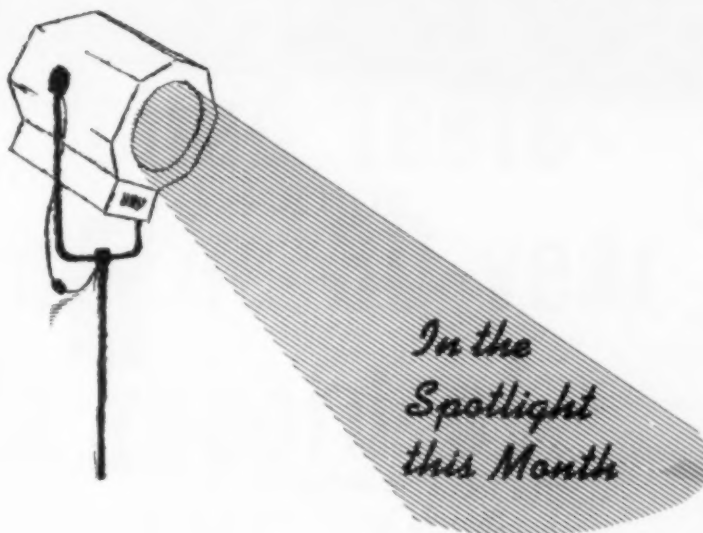
I have read with interest, the article in your February, 1960 issue, reviewing the proceedings of the Northeastern Weed Control Conference. In it a number of new herbicides are mentioned. Some of them are unfamiliar to me, and I would like to learn more about them by contacting the manufacturers. Could you give me the names of the manufacturers of the following products: Emid, Trietazine and Urab.

Paul E. Bernard  
DOANE AGRICULTURAL SERVICE INC.  
St. Louis, Mo.

*We too, have difficulty identifying the many new pesticides brought out each year. It takes many phone calls to trace the new products, and sometimes we are not successful. When co-workers in the industry can't identify the product, it would seem obvious that the manufacturers have failed badly in keeping industry informed. By way of example, we haven't identified Urab or Trietazine. Emid is an experimental herbicide based on 2,4-dichlorophenoxy acetamide, made by AmChem Products, Ambler, Pa.*

*If any of our readers can help us with the chemical identification and manufacturer of the following,—we would very much appreciate it: Urab, Trietazine, Napchlor, Urox, Beulene, Acrolein, Napsul, and CMPP.*

DECEMBER, 1960



*In the  
Spotlight  
this Month*

- **Fertilizer Manufacturers Appeal . . .** Such problems as handling dusty phosphate; plant formulation changes because of variation in phosphate specification; overformulation losses tracing back to poor timing of receipt of car specifications, were cited in an appeal to raw material suppliers for help for the fertilizer mixer at the 1960 Fertilizer Industry Round Table. Page 30.
- **Granular Systemics . . .** Yield increases of potatoes resulting from treatments of granular insecticides at planting were not satisfactory, according to reports from Maryland researchers. Lima bean yields were not significantly affected, nor were yields of sweet corn at the 5% level." Page 46.
- **Fertilizer Production Clinic . . .** IMC concludes a series of training sessions for fertilizer production men, which brought IMC technical service experts to 11 states with discussions and answers to questions regularly asked by fertilizer production men: fertilizer shrinkage, dust control, liquid handling, quality control, plant maintenance and plant supervision. Page 44.
- **Pesticide Residues . . .** Residue analysis is the last line of defense against seizure for exceeding tolerance. Laboratories engaged in residue work are urged to run frequent checks with samples containing known amounts of pesticides as proof that they are operating efficiently. Page 42.
- **Fertilizer Solutions . . .** Liquid manufacturers are urged to concentrate on the sale of application equipment to farmers, — "A man with an investment in liquid fertilizer applying equipment is not likely to purchase another form of fertilizer," solutions manufacturers told at annual meeting. Page 33.
- **What is FARI . . .** Florida Agricultural Research Institute, an organization of both fertilizer and pesticide manufacturers in Florida, concentrates on collecting and distributing information to its members on all subjects affecting the two industries. Page 37.
- **Sales and Selling . . .** Characteristics of top flight salesman listed as competitiveness, ability to think and confidence, — at 9th annual Chemical Sales Clinic. Page 35.

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Cordially,

ROHM & HAAS COMPANY  
Agricultural & Sanitary  
Chemicals Department

CARLOS KAMPMEIER

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## INDUSTRY MEETING CALENDAR

Dec. 5-7—Carolinas-Virginia Pesticide Formulators Assn. annual meeting. Carolina Hotel, Pinehurst, N. C.

Dec. 5-9—American Society of Agronomy, Annual Meeting, Morrison Hotel, Chicago.

Dec. 6-8—National Aviation Trades Association, annual convention.

Oklahoma Biltmore Hotel, Oklahoma City, Oklahoma.

Dec. 12-14—North Central Weed Control Conference, Hotel Schroeder, Milwaukee, Wis.

Jan. 4-6—Northeastern Weed Control Conference, Hotel New Yorker, New York.

Jan. 5-6—Wisconsin Pesticide Conference With Industry, Memorial Union, University of Wisconsin, Madison.

Jan. 5-7 — California Aerial Applicators Association, 11th Annual Convention, El Dorado Hotel, Sacramento, Calif.

Jan. 10-11—Fertilizer Dealers Short Course and Fertilizer Industry Representatives Conference, Memorial Union, Iowa State University, Ames, Iowa.

Jan. 11-13 — Beltwide Cotton Production-Mechanization Conference, Poinsett Hotel, Greenville, S. C.

Jan. 12 — Clemson College Fertilizer Meeting, Wade Hampton Hotel, Columbia, S. C.

Jan. 12-13 — Arizona Aerial Applicators Association, 8th Annual Meeting, The Wigwam, Litchfield Park, Ariz.

Jan. 18-19—WACA Northwest Conference (formerly Northwest Agricultural Chemicals Industry Conf.) Benson Hotel, Portland, Ore.

Jan. 18-20 — Southern Weed Conference, Hotel Soreno, St. Petersburg, Fla.

Jan. 19-21—Mississippi Aerial Applicators Association, annual convention, Buena Vista Hotel, Biloxi, Miss.

Jan. 23-25 — Southeastern Branch, Entomological Society of America, annual meeting, Admiral Semmes Hotel, Mobile, Ala.

Jan. 25-26 — TVA Symposium on "Effects of Environment on Crop Response to Fertilizers," Muscle Shoals, Ala.

Jan. 26-27 — Colorado Agricultural Chemicals Association, annual meeting, Cosmopolitan Hotel, Denver, Colo.

Feb. 14-15 — Aquatic Weed Control Society, 2nd Annual Meeting, LaSalle Hotel, Chicago.

Feb. 15 — Pesticides Review for Coastal Counties, co-sponsored by Western Agricultural Chemicals Assn. and California State Polytechnic College, San Luis Obispo, Calif.

Mar. 13-15—Spring Meeting, Western Agricultural Chemicals Association, Disneyland Hotel, Anaheim, Calif.

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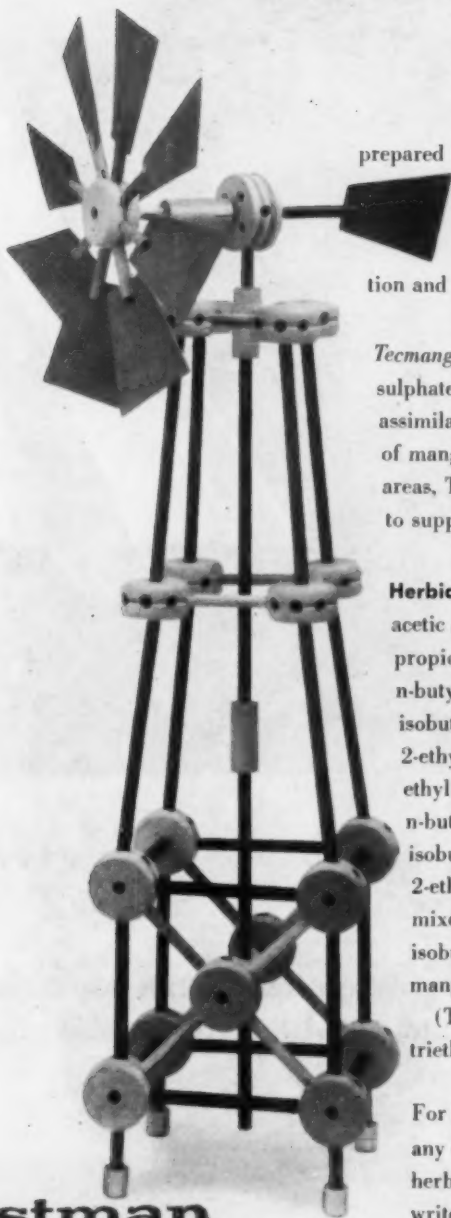
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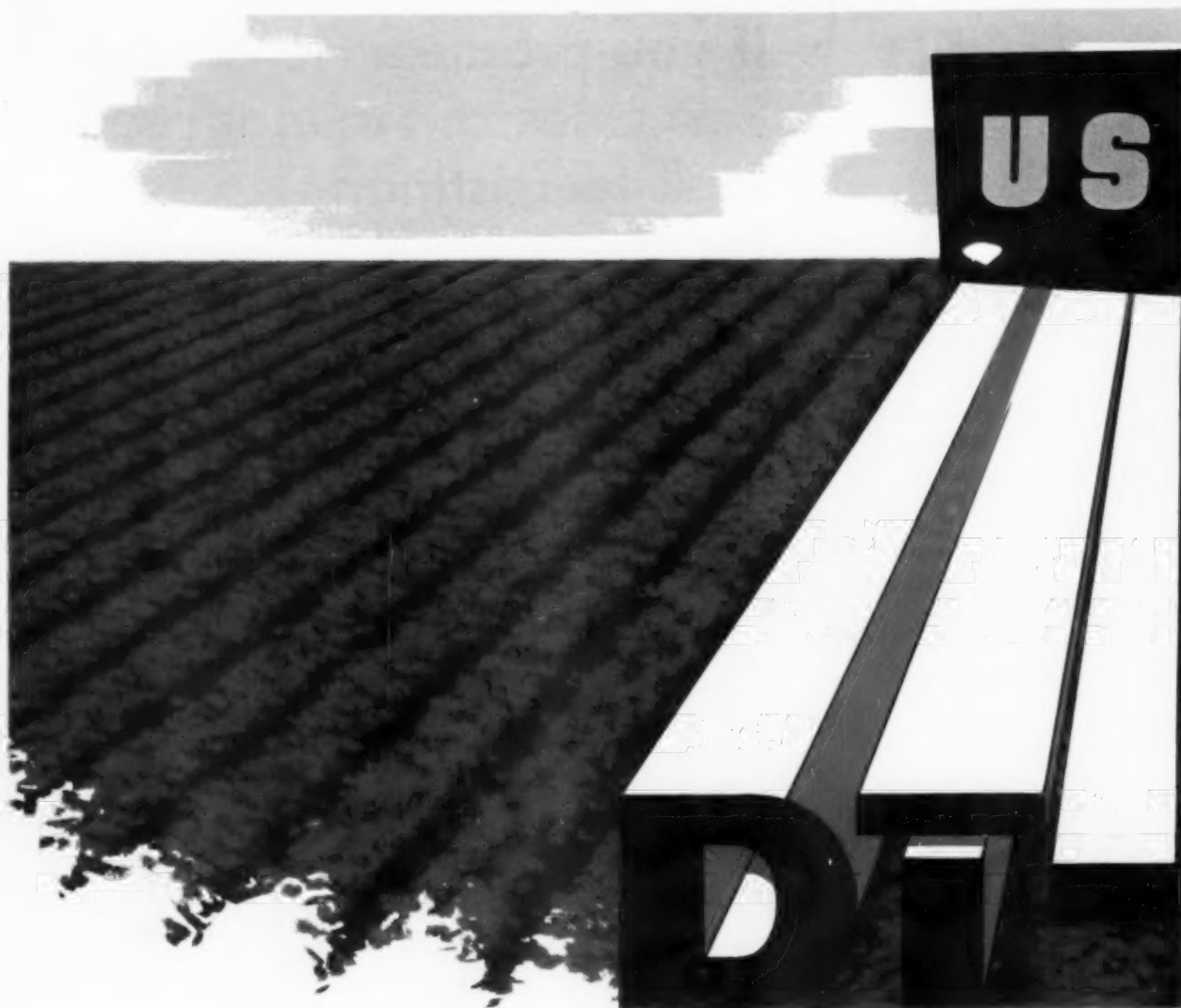
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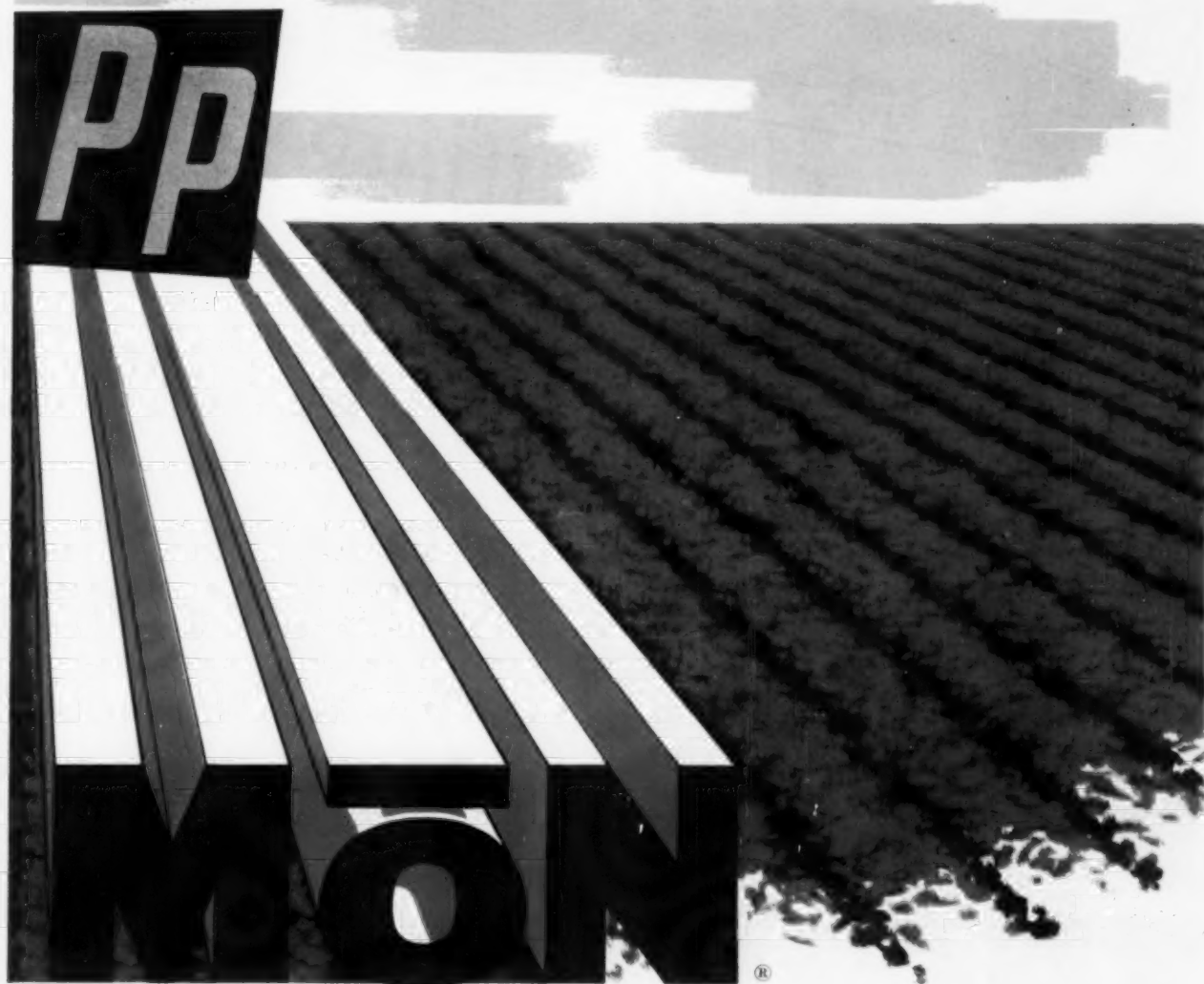


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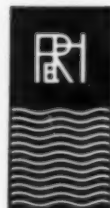
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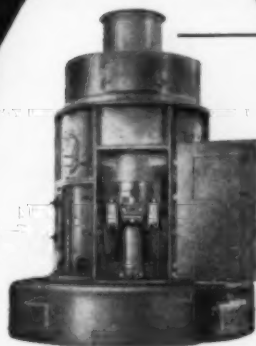
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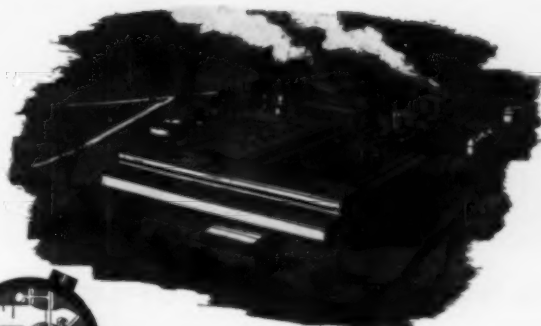
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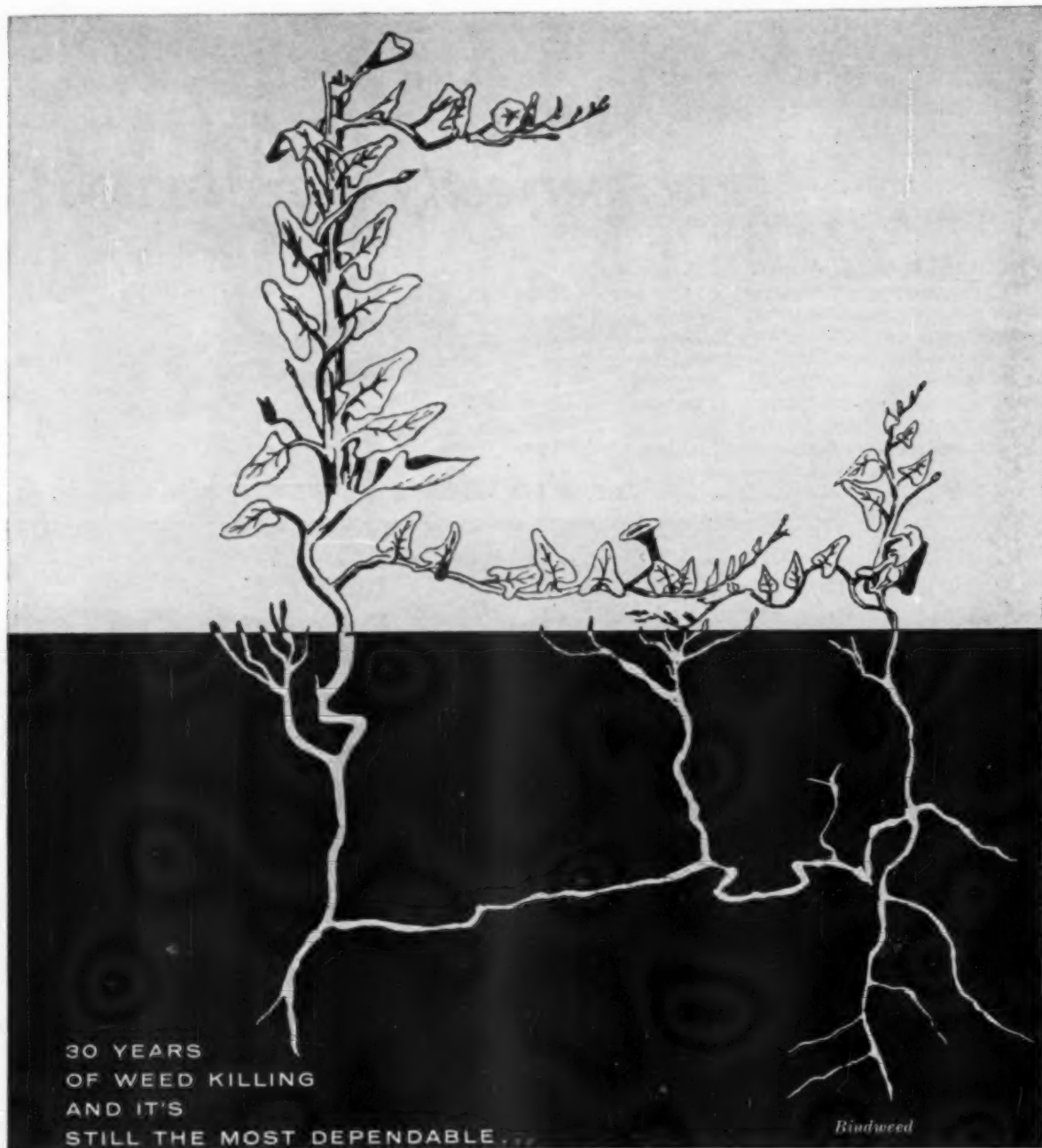
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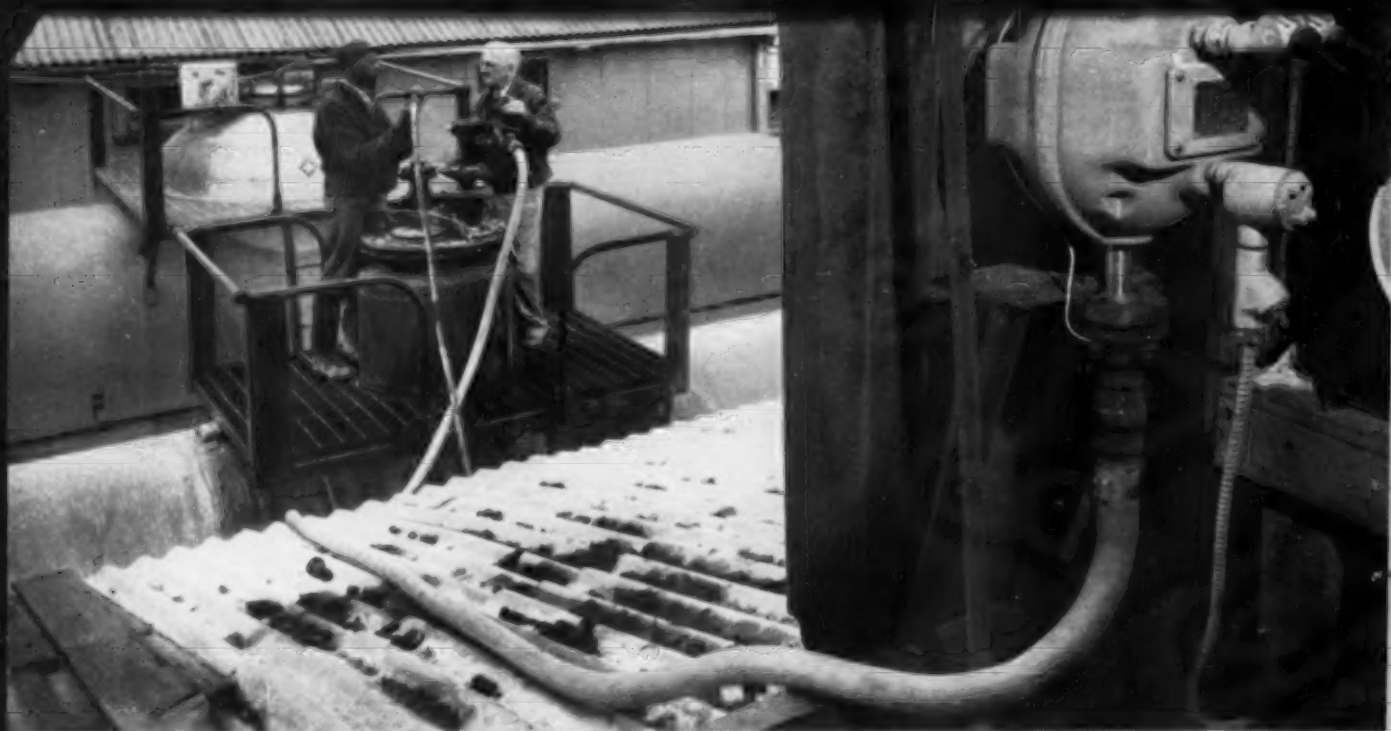
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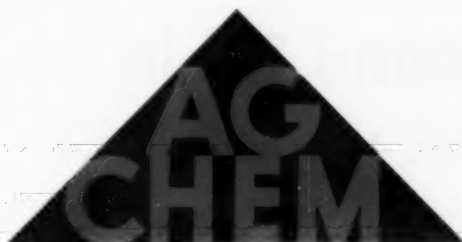
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## EDITORIALS

**A**N agricultural chemicals firm must be part educator if it is to operate successfully in the pesticide business today. This, at least, is the opinion of A. E. Forster, president of Hercules Powder Co., as expressed in a recent address before the Societe de Chimie Industrielle, in Barcelona, Spain. And Mr. Forster, we might add, is in an excellent position to know what he is talking about, for Hercules Powder has been one of the top practitioners of the art of successful marketing of pesticide products in an industry which has not developed too many such shining examples.

One of the big problems the pesticide industry faces, Mr. Forster emphasized, is to show the farmer how the industry's products must be used, — and not be content with merely selling him a product and then letting him figure out how to apply it. He stressed the importance of field demonstrations, and maintaining good communications with entomologists, plant pathologists, and local, state and federal workers in agriculture. The pesticide industry, he believes, must be strengthened with more technically trained personnel who can, in Mr. Forster's words, "talk to their professional counterparts in government and research, and to the farmers in their own language."

It is worth recalling that Hercules has done a tremendously successful job of selling its particular pesticides for the control of cotton pests over a period of more than ten years, — and this in a market where new pesticides normally survive only a season or two. Hercules faced the "resistant" boll-weevil talk of a few years back, and an occasionally hostile research worker, and kept hammering away month after month at the continuing job of keeping its line of communications open, to get its message through to the farmer on how its products could and should be efficiently employed. Its success

in doing this job, making profits for Hercules, and at the same time helping to keep America's food supply the most wholesome and sanitary ever known, represents an example that could profitably be emulated by other basic producers of pesticides.

\* \* \* \* \*

**T**HE ability of fertilizer manufacturers to hold the price line has been one of the remarkable economic achievements of the past twenty years. Fertilizer prices have advanced but little during this period, despite rising costs of labor, equipment and materials, mainly because the men who operate fertilizer plants have been able to take advantage of improved technology.

The point soon will be reached, however, at which no more savings can be made through greater plant efficiency without help from suppliers of raw materials and processing equipment. Fertilizer manufacturers are greatly handicapped in production planning by inadequate and nonuniform raw material specifications, as was pointed out in this magazine last month when results of a survey of fertilizer manufacturers were made public. The returns of the survey indicated that there is a great need for uniformity in the fertilizer industry. There is a need for some standardization of raw materials and uniformity in nomenclature to cover the complete description of processed raw materials.

The task of the plant superintendent, already complicated by the wide variety and number of special grades and mixes offered in the United States, is made doubly difficult by the variations in analysis of raw materials arriving at his plant. Without a complete and uniform accounting of the contents of each carload of raw material, the fertilizer manufacturer is faced with the

(Turn to Page 99)



# Fertilizer Industry Round Table



## holds tenth annual convention, Nov. 3-5

*Executive Committee of the Fertilizer Industry Round Table (l. to r.) A. Spillman, Fertilizer Manufacturing Cooperative; H. L. Marshall, Olin Mathieson Chemical Corp.; and J. Reynolds, Davison Chemical Co. Vincent Sauchelli, chairman of the Round Table was not at this 1960 meeting because of a project in India.*

**F**ERTILIZER manufacturers, meeting at the Fertilizer Industry Round Table's tenth annual convention, took another step toward further improving fertilizer technology and production operations. At the November 3-5 sessions, held at the Mayflower Hotel, Washington, D. C., plant superintendents compared data on plant terminology and material specifications, which emphasized a need for uniformity,—first among fertilizer plants,—and second in raw materials supplied to the industry.

Representatives of phosphate, potash and nitrogen producers reported on the availability of these materials, outlining the manufacturing operations involved, and relating the limitations on specifications of raw materials to the demands of fertilizer users. A panel of fertilizer manufacturers stated the case for fertilizer mixers and manufacturers.

One of the major problems with which a fertilizer manufacturer is faced is that of dollar and material losses due to over formulation. As stated by G. Mautner, Baugh & Sons, the fertilizer manufacturer: (1) must absorb the losses due to overformulation in finished fertilizer; (2) pay a penalty if material is under specification; and (3) pay the supplier for every unit of plant food sent him, even though he (the mixer) may have formulated on the basis of a lower analysis (because he had not been advised of the actual

analysis at the time shipment was received).

Mr. Mautner indicated that a supplier should give enough information—which would be at the plant on receipt of the carload—so that necessary adjustments might be made in the plant operation to adjust for variations in analysis. "Tell us what's in the car," appealed Mr. Mautner.

W. E. Jones, Northwest Cooperative Mills, confirmed the problem facing the mixer,—as stated by Mr. Mautner,—and asked raw material suppliers to outline the specifications that they (the suppliers) can meet realistically. He directed this question particularly to phosphate suppliers. Another point he raised is that of "exotic phraseology" among suppliers. He suggested that the product name be synonymous with specification,—and that it would be most desirable for the supplier to skip "fancy names" and just give specifications. "This whole problem," he observed, "can be labeled a 'lack of communication'."

Reviewing operations at Robert A. Reichard, Inc., E. A. Reichard reported that their experience indicates a lack of tests on incoming superphosphate. Test data is received some three days after arrival of trucks at the plant. To be sure of meeting grade specifications, said Mr. Reichard, the plant superintendent regularly overformulates, as do other fertilizer manufacturers.

In spite of overformulating practices to meet grade specification, Grayson Morris of Southern States Fertilizer cited USDA figures which showed an increase in plant food violations in 1958-1959. The figures, he said, also show an increase in penalties assessed and refunds to purchasers. He pointed out that an analysis of the grades sampled and those not meeting specifications shows that a minor number of grades are consistently the same offenders,—that officials are indulging in selective sampling of those grades which had not met specifications previously. By way of illustration, panel members pointed out that a survey in Ohio and Indiana on grades showing deficiencies indicated that 50% of the 12-12-12 grade fertilizers were deficient in nitrogen; and 80 to 85% of the 16-8-8 grade were deficient in nitrogen.

The panel "Standardization of Raw Materials," was introduced by H. L. Marshall, Olin Mathieson Chemical Corp., secretary of the Fertilizer Round Table. A survey on plant and laboratory practices in the fertilizer industry conducted earlier this year by *Agricultural Chemicals* was reported by Miss Eleonore Kanar, editor. (See *Agricultural Chemicals* issues for 1960, November, pp. 52, 53 and March, pp. 52, 53 for complete details).

Rodger Smith, Eastern States Farmers Exchange, observed that many production plant losses are largely due to lack of standardization:



- 1) lack of uniformity of raw material
- 2) lack of information on raw material ingredients
- 3) ammoniation practices
- 4) segregation of ingredients in the mix
- 5) operating errors

The first two problems stated above will complicate producers' problems by causing: undue overaging on the part of the manufacturer; a financial loss on ingredients (undue overages cost the manufacturer from \$1-\$2/ton); and inability to match particle size.

"What we need in the industry," said Mr. Smith, "are specifications; a uniformity on tolerances; information on analyses; and uniform or similar terminology." "Standards," continued the speaker must be of a current nature,—with allowance for change as processes change.

"Before we can discuss standardization of materials," remarked E. D. Kingsbury, Kingsbury & Company, "we must first ascertain what products are most advantageous, taking into consideration all facets of production, costs, and the distribution of plant food within the product. We must, it seems to me, justify our present selections of granular, coarse or standard material, and then recommend changes that we would like to see made. If we can agree in the main, standardization should be no problem."

Following this introduction, Mr. Kingsbury reviewed the advantages and problems involved in using granular, coarse or standard potash in low nitrogen grades and in 1-1-1 grades (such as 12-12-12). He observed that there is a significant difference in the amount of dust contained in various products, and that experience at Kingsbury & Company shows that "some producers exercise better control over particle size throughout the season than others."

Another panel speaker asked, "If one producer can do it, why can't others?."

"Tell us what's in the car!"

"Remove dust particles from rop triple!"

"Drop 'exotic' names, and identify solutions!"

"Exercise better control over particle size!"

*—some of the requests of the 'user' panel directed to raw material suppliers at "Standardization Symposium"*

"One company is producing an almost dust free grade of potash" said Mr. Kingsbury, "with the approximate specifications:

|     |       |
|-----|-------|
| 5%  | 10-16 |
| 10% | 16-20 |
| 75% | 20-32 |
| 10% | - 32  |

We believe that this, at least with present formulas and equipment, is an ideal standard grade. In the future," he continued, "we suggest that a more dust-free standard be considered with the specifications listed above."

In connection with phosphates, Mr. Kingsbury confirmed the observation of other fertilizer mixers that "standardization of triple specifications between producers is lacking . . . moreover," he said, "there is a lack of standardization between products manufactured by the same producer. Part of this problem is probably due to the old culprit 'pile separation.'"

While a solution to this problem is difficult, improvement should be made.

"We have used coarse triple in certain formulations containing nitrogen, but due to low ammoniation, we have standardized on rop."

Again voicing the common complaint of fertilizer mixers, Mr. Kingsbury stated that "run of pile triple produced today needs to be improved. It is not the -35 but rather the -100 and -200 mesh material that is causing dust problems. We suggest therefore, that producers remove these very fine particles just prior to loading."

In reviewing techniques of production, Mr. Kingsbury commented "we have used since 1956 a gear reduction for our weigh-belt to increase accuracy, we have coordinated solid and liquid flow with an electric timer, developed a new sparger, and will soon complete our transition to electromag-

"Users' Panel: standing: E. A. Reichard, Robert A. Reichard, Inc.; W. E. Jones, Northwest Cooperative Mills, Inc.; and R. S. Smith, Eastern States Farmers' Exchange, seated: E. D. Kingsbury, Kingsbury & Co.; G. B. Morris, Cooperative Fertilizer Service; and W. G. Mautner, Baugh & Sons Co.



netic meters. We feel that these improvements have a direct bearing on the selection of raw materials used in manufacturing.

"With the advent of the O.K. sparger (O'Neill-Kingsbury), we have been able to increase our flexibility in formulation. We can, merely by turning valves, effect a difference in plasticity equivalent to 200 lbs. of water per ton. Three

we produce granular fertilizer for two plants, 30 tons per hour of end product becomes necessary on some grades during the height of the season. Coarse potash is used in low liquid phases, combinations of coarse and standard in medium liquid phases, and standard in high liquid phases.

"In an effort to improve our product chemically, as well as phy-

acid and nitrogen solutions, Mr. Kingsbury remarked that "so long as we can pump the material out of the tanks, purity of the acid is relatively unimportant. More standardization with respect to solutions is warranted,—and many obsolete combinations should be eliminated; however, all of us are on the lookout for better combinations of ammonia, nitrate, urea and water . . . and new solutions that are superior to former combinations should not be sacrificed for the sake of standardization."

Following the questions and problems discussed by the "Users' Panel" a "Raw Material Producer's Panel" reviewed production and operational problems of the supplier. Comments of this panel will be reported in the January issue of *Agricultural Chemicals*.

**Using granular potash in low nitrogen grades aggravates separation in the screen ranges with respect to phosphate and potash, while nitrogen is relatively constant. Coarse potash follows the same pattern but to a lesser degree. With standard potash, there is less separation, however, there is a tendency to build up potassium in the recycle.**

**Experience reported at Kingsbury & Company**

pipes under the bed and two on top have replaced the conventional T.V.A. design.

Potentiometer readings taken at many locations under the bed indicate good distribution of the liquid phase, especially with regard to minimizing temperatures throughout the complete mass. This new sparger, as you would expect, has allowed us to decrease the particle size of the potash used, if we so desire.

"Currently we are trying to have our cake and eat it too. Since

sically, we have recently changed to 7 and 8 mesh tyrod screens on the top, and 14 and 16 mesh on the bottom to effect an end product that will screen 95% -6+16.

"Separation of particle size within our bins has been greatly reduced by new "desegregators." Small reversible belts traveling 800 feet per minute are minimizing the cone pile. This, we feel, will go a long way towards offsetting the disadvantages of using coarse potash."

Commenting on phosphoric

(1) W. Whitlock and I. Garfield, Texaco, Inc.; J. Whittington, Olin Mathieson Chemical Corp; and McKinley Morton, Central Chemical Corp.

(3) W. Lutz, Dorr Oliver Co.; H. B. Tatum, U. S. Phosphoric Co.; and T. Hignett, TVA.

(2) E. Carnell and H. Wheless both of Davison Chemical Div., W. R. Grace & Co.; A. Phillips, TVA; and Walter Sackett, Sr., A. J. Sackett & Sons Co.

(4) R. Church and W. Lewis, E. I. du Pont de Nemours & Co.; also Roger Smith, D. O. Conrad, L. Cizek and A. Trubey, all of Eastern States Farmers Exchange



# Fertilizer Solutions Meeting Attracts 536

ONLY ten per cent of the farmers in Iowa fertilize adequately, Roswell Garst, Coon Rapids, Iowa, told the 1960 convention of the National Fertilizer Solutions Association, Nov. 9 to 11, at the Peabody Hotel in Memphis, Tenn. Mr. Garst advised farmers not only to use fertilizer on their crops but to feed urea to cattle.

He said that to feed soybean and cottonseed meal to cattle is "sheer waste." "God gave cattle, sheep, and goats, which are ruminants, two specially equipped stomachs and they don't require the same rich foods most other animals do," he said. "I have been feeding urea to cattle for 12 years and it works perfectly," he continued, "and it costs about a third as much as other cattle feeds."

Mr. Garst said he mixes urea with blackstrap molasses, sprinkles on a bit of dicalcium phosphate, and then waits for his cattle to grow and get fat. "If enough farmers would feed urea to cattle, we could grow more meat and get butcher shop prices down," Mr. Garst said. He added that this is one of the ideas he has passed on to Premier Nikita Khrushchev of Russia, whom he has visited at his dacha on the Black Sea and who has visited him in Coon Rapids.

"Soybean meal is too fine a food to waste on cattle," he said. "It consists of 54 per cent amino acids and is one of the best possible foods for human beings—as the Chinese have known for centuries.

Mr. Garst feeds urea by dissolving it in blackstrap molasses and spraying or sprinkling it over any old forage that happens to be around—hay, dead grass, corn cobs, or whatnot.

More than 530 persons registered for the three-day meeting. This was more than 50 persons higher than the 1959 registration and was the highest ever for the association.

**Future of the liquid fertilizer industry depends on the development of large, home-based plants, which will serve and be surrounded by blending installations, — the individual blenders will be able to work closely with local farmers.**

Hugh S. Surles Jr., manager, nitrogen solutions department, Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C., told the group that American businessmen, banded together in trade associations, can accomplish more than any other organizations on earth. It is time, he said, that we appreciated our strength and serviceability and power. Mr. Surles was speaking as the outgoing president of the National Fertilizer Solutions Association.

"Unless we as businessmen and members of trade associations 'watch our corks,' " he said, "we are unconsciously drifting toward a possible 'day of doom' for free enterprise in our nation and the world." Many people, he pointed out, seem to feel that a profit is a "terrible injustice." "Yet," he continued, "the profit motive, within fair limits, is the strongest economic drive ever developed by civilized man." Mr. Surles said that there is nothing wrong with a fair profit as long as it is tempered with the element of fair competition.

Good firm management is the heart of fertilizer sales, Morris T. Woosley, West Kentucky Liquid Fertilizer Co., Hopkinsville, Ky., told the convention. He said that a total fertilizer program is needed for each customer, and fertilizer grades should be tailored to fit individual needs. The final answer, he said, is not what does fertilizer cost but what will it produce.

Liquid fertilizer manufactur-

ing is unique, Mr. Woosley pointed out, in that the manufacturer must take into account several different areas of operation. Among these he listed engineering, manufacturing, storing, selling, and applying fertilizers. A plant installation, he reminded, must consistently produce uniform grades of fertilizer. In Mr. Woosley's plant, at Hopkinsville, a metering system is used and with it they have been able to maintain accuracy of .5 per cent, he said.

Liquid fertilizer installations, he said, originally were conceived to serve only the immediate surrounding area of each plant. He predicted, however, that the future of the industry depends on the development of large home-based plants which will serve and be surrounded by blending installations. The individual blending installation will be able to work closely with local farmers, he pointed out.

Mr. Woosley also urged liquid manufacturers to concentrate on the sale of application equipment to farmers. "We have got to get equipment into the hands of the man who is going to buy our product," he said. Until we do this, he added, the customer will have too much opportunity of changing his mind. A man with an investment in liquid fertilizer applying equipment is not likely to purchase another form of fertilizer. Mr. Woosley described a unit he has developed that can be used as a nurse tank and also as an applying machine.

In addition, Mr. Woosley said that results are the key to the success of any program. Producers, he said, should not be satisfied to sell general grades of fertilizer to meet general conditions. Fertilizers should be tailored to each field and crop. In this way, he said, results, in the form of larger and greener crops, will be obvious. The liquid producer who neglects the demonstration of results from proper fertilizer use is making a mistake, he warned. Mr. Woosley urged producers to follow up fertilizer applications with such devices as photographs and yield figures. "One of the main things that we have to sell," he concluded, "is fertilizer results."

Dr. John L. Strauss, vice-president of Ris-Van, Inc., Belmond, Iowa, a subsidiary of Stepan Chemical Co., Chicago, traced the history of the development of complete liquid fertilizers. He listed three factors that he said will insure the continued growth of liquid fertilizers. They are: lower production costs, the need for new formulations, and the need for higher analyses. Solutions are available, he said, that sometimes cost less than the individual ingredients themselves.

Dean R. McHard, Agricultural Business Co., Lawrence, Kans., discussed the advantages of water soluble phosphates at the meeting and, in this regard, told of the

activities of a theoretical pellet of 0-45-0 fertilizer. On the ground, he said, the pellet is in contact with water but approximately  $\frac{1}{3}$  of the pellet does not dissolve readily and becomes insoluble dicalcium phosphate. The rest of the pellet, he continued, turns into a phosphoric acid material with a pH as low as 1.5. This, Mr. McHard continued, dissolves iron, aluminum, and manganese out of the soil and reacts with them to form slightly soluble precipitates. He also discussed a series of experiments recently conducted to compare ammonium phosphate with superphosphate. In each of 16 test plots, he said, the ammonium phosphates outgained the superphosphates in crop yield.

The future for the liquid fertilizer market is unlimited, L. W. Galloway, assistant general sales manager, Baugh Chemical Co., Baltimore, told the group. He pointed out, however, that the approximately 500,000 tons of liquids that currently are being produced are only about 2 per cent of the total market.

The principal advantage of liquid fertilizers, he said, is closeness to the farmer. The dry fertilizer plants, he said, tend to be located in cities, but liquid plants are in the actual area of the product's use.

In order to take advantage of these favorable circumstances, he

said, the liquid fertilizer industry must become more customer conscious than product conscious. Marketing, he continued, is a study of the human being. It is a study of what the people want and then making it available to them. In the plant food industry, Mr. Galloway declared, we must be aware of the farmer's needs.

Mr. Galloway blamed the short sightedness of the dry fertilizer industry for the success of the liquid industry and the bulk blenders. Where the liquid industry

*(Continued on Page 90)*

1. Ned Tyson, T. P. Fertilizers, Inc., Herman, Neb.; Rex Reagan, U. S. Industrial Chemicals Co.; and J. C. Carlile, J. C. Carlile Corp., Denver, Colo.
2. Eugene A. Reichard, Robert A. Reichard Inc., Allentown, Pa., and James Rogers, Sohio Chemical Co., Lima, Ohio.
3. (rear) Chet Bullington, Stauffer Chemical Co., New York; Don Ruggeri, Victor Chemical Works, Division of Stauffer Chemical Co., Chicago; Charles Graves, Victor; and William Anderson, R. & S. Corp.; Akron, Mich. (foreground) Mrs. Ozelle Baker and Mrs. Spencer Whitlock, both of B. I. Whitlock Co., Pratt, Kansas.
4. George Weber, Spraying Systems Co., Bellwood, Ill.; Roy Sorrels, S&N Sprayer & Chemical Co., Greenwood, Miss.; H. K. Walters Jr., TVA, Wilson Dam, Ala.; J. C. Norris, S&N; and Donald Weber, Spraying Systems.
5. W. R. Stevens, Barnard & Leas Mfg. Co., Cedar Rapids, Iowa; Willis Buie, Canada Packers Ltd., Toronto; Ted Neeley, Potash Company of America, Carlsbad, N. Mex.; and J. D. Bowne, Canada Packers Ltd., Chatham, Ontario.
6. C. V. Little, Black, Sivalls & Bryson, Inc., Ardmore, Okla.; Dr. E. C. Young, Black, Sivalls & Bryson; Paul E. Potterton, Spencer Chemical Co., Steger, Ill.; W. M. Harris, Spencer Chemical Co., Jackson, Miss.; and S. W. Hedlund, Black Silvals & Bryson.





## CHEMICAL SALES CLINIC

**Market research working with sales will help develop increased markets. Product manager is particularly dependent on the salesman to provide: (1) profits, (2) information necessary for intelligent decisions on product requirements, pricing policies,—information for future growth.**

**The answer to "How Can I Sell Him?" is to find out how to make him want to buy.**

**Formula for a top flight salesman includes: organization, close contact with sales manager, careful evaluation of customer objections and discussion with sales manager.**

**A** PPLYING a *calculated* approach to sales work is useless because it does not take into consideration the many facets of business over which one has no control, Walter H. Burgess, Northeast District Manager, McKesson & Robbins, Inc., told the 9th Chemical Sales Clinic, held Nov. 14 at the Roosevelt Hotel in New York. The clinic is sponsored by the Salesmen's Association of the American Chemical Industry, Inc.

Mr. Burgess told the group, "You cannot decide that X number of hours of work per day will produce so much business and that this is a set formula for sales work."

Some of the characteristics of a top-flight salesman listed by Mr. Burgess are: he organizes his work; he needs little supervision, but keeps in touch with the sales manager when the situation requires; he does not offer price-type selling; he treats his job as a responsibility; and he reports customer objections to the sales manager for further information or assistance.

T. M. Risch, field sales manager, Heyden Newport Chemical Corp., said that the three characteristics of a top-flight salesman are thinking, competitiveness, and confidence. With these traits, he said, a salesman can become a top-flight. Without them, he cannot.

The first thing we have to do to sell someone, Mr. Risch said, is to find out what we have to do to

make him want to buy. This is done by obtaining knowledge of the customer, he explained. Only after this has been done, he reminded, can the salesman begin looking for the key to the problem of "How can I sell him?"

A more effective relationship between salesman and market research was discussed by J. P. Barry, product manager of the Plastics Division of Allied Chemical Corp. He said that the efforts of market research departments should delve more into a company's customers and industries so that there will be more information concerning population shifts, population growth, new industry concentrations, and over-all economic trends. With this information, a company may better plan its expansion so that new plants will be ideally located and sales efforts and distribution will be more effective, he said. In addition, he continued, the salesman working closer with the market research department will have a greater participation in the marketing function and will broaden his own scope.

The present rate of expansion in the chemical industry, Mr. Barry said, is approximately 7 to 8 per cent per year, compared with an over-all industry growth of 5 per cent. The chemical industry, he added, ranks fourth in assets and fifth in sales. Market research, working with sales, Mr. Barry said, must direct its efforts to help

develop those avenues which will produce wider product development and consume excess capacity. Then, he concluded, as we move through this competitive period of the chemical industry, sales will continue to be made.

The key to a more effective relationship between the field salesmen and product management is recognition and understanding of their mutual goal and the understanding and skillful use of the specific communication tools available to stimulate and coordinate their individual efforts toward that goal, Clarence H. Sigler, Naugatuck Chemical Division, U. S. Rubber Co., told the group. The product manager, he said, is particularly dependent on the salesman. First, to provide the volume sales that are necessary to produce the required profit *now*, and second, to provide the information necessary so that intelligent decisions can be made on pricing policies, new product requirements, and the other operations involved with the product line's *future* growth.

The salesman, in turn, is dependent on product management to provide him with the product he needs, and the selling tools to make his product the most attractive to his customer, Mr. Sigler said.

The so-called "non-productive" duties of a salesman, such as forecasting and writing call reports and various special reports re-



quested, Mr. Sigler pointed out, actually are a means of stimulating product management to provide him with the products and service he needs. Other means of stimulating this flow of activity between product management and the salesmen listed by Mr. Sigler were joint field visits to key accounts of key industries by both the salesman and the product manager, and periodic visits by the salesman to his technical service center to become familiar with new materials and processes.

J. E. Newman, American Mineral Spirits Co., spoke on multi-level selling and depth relationships. In some quarters, he said, multi-level selling is confused with national account selling. It also sometimes is confused with trade relations, he added. Actually, he pointed out, it is neither, although it sometimes may advantageously be employed in national account solicitation or in improving trade relations.

A company which is introducing new products or promoting new uses for established products should be actively engaged in depth selling, Mr. Newman said. It is no reflection on either purchasing departments or salesmen to say that they cannot always be fully conversant with developments in their organizations or industries which will indicate a need for, or a market for, a product not previously considered, he said.

Conversely, he added, the suppliers and consumers, management, research, production, and other departments may not know of the potential need, on the one hand, or the potential or actual availability on the other.

This is where depth penetration finds its best justification, he said. Mr. Newman listed a number of techniques that may be employed to achieve multi-level relationships between companies. One is the immediate direct approach, where the individual concerned gets in touch with the man he wants to meet, explains what he has in mind, and arranges to

get together for a discussion. Here the salesman can be of help if he knows the account well enough to suggest the proper individual or individuals to approach, Mr. Newman said.

Sometimes, however, it may be advisable to await a favorable opportunity to meet the desired individual—an association gathering, trade show, etc., he added. This approach usually would be indi-

cated if there is considerable doubt as to who to approach, as it could afford an opportunity for preliminary discussion without full involvement. Whatever the technique employed, however, it should be made clear to the individual or group contacted what the purpose of the relationship is and how it is believed their company may benefit from it, Mr. Newman pointed out.★★

#### Monsanto, Niagara Discuss Marketing at FCMS Seminar

“THE market knows more about itself than does the industry,” observed John L. Gillis, Monsanto Chemical Co., in addressing some 40 marketing specialists attending the second annual marketing seminar last month, sponsored by *Farm Chemicals*, a Philadelphia trade magazine. Continuing, Mr. Gillis recommended that industry stop thinking of organizational convenience, and give more thought to the market itself, — “to get and hold the business!”

The speaker outlined the recent re-organization at Monsanto Chemical Company and formation of the new Agricultural Chemicals Division. “This,” he said, “may be the first of many moves that may be necessary in the fast moving agricultural chemicals market.”

One of the changes in Monsanto's approach to the agricultural chemicals market will be use of the same field men for handling pesticides, fertilizers and feed additives. “Any product going to the farm market will be handled by the Agricultural Division,” explained Mr. Gillis. In reply to questions from the audience, the speaker pointed out that although marketing is a line function, “marketing services are handled as a ‘staff function.’” Technical service is a separate section in the marketing division, and handled as a line function.

In response to a question on promotion of new Monsanto products, Mr. Gillis reported that

introduction of new products the first year is a responsibility of the Development Department, — the cut-off point in the promotion arrangement is the first significant commercial sale of the product. He also indicated that on new proprietary products, it is the responsibility of the manufacturer or developer to introduce such a product to the market, — and not the responsibility of land grant colleges or USDA.

The agricultural chemicals market is growing, — and its future is promising, Mr. Gillis concluded. “Monsanto's reorganization is evidence of its confidence in the agricultural chemical field.”

Stuart Bear, division manager of Niagara Chemicals Division, FMC, explained his company's experience in policy formation, and outlined Niagara's reorganization program of 1958. Niagara salesmen are full line salesmen within the agricultural chemicals department, he reported, and plans for promotion and product sale are the responsibility of each “profit center.” One of the major problems in the reorganization program, stated Mr. Bear, was to convert sales-oriented supervisors into managers.

The staffing program at Ortho Division, California Chemical Co., was presented by M. E. Wierenga, with discussion of selection and training of personnel. The speaker emphasized the importance of building an organization around people.

## What is FARI?

# FLORIDA AGRICULTURAL RESEARCH INSTITUTE

**FARI, — the Florida Agricultural Research Institute,—represents both the Florida fertilizer and pesticide manufacturer . . . working with all agricultural groups in the state.**

**FARI was prominent in developing the Fertilizer Control Research Project, studying fertilizer manufacture and control.**

**Where purely pesticide matters are concerned, a committee is appointed from pesticide members of the organization to study the problem. Current plans call for a pesticide meeting to study precautions, safety, public relations, etc, and avoid a situation like the cranberry scare.**

**T**HE Florida Agricultural Research Institute (FARI) is a unique organization in the field of agricultural chemicals as it represents both fertilizer and pesticide manufacturers. The Institute is a non-profit corporation consisting of approximately 48 manufacturers of mixed fertilizer and pesticides. No associate memberships are permitted. These companies represent national companies, Florida companies doing only a Florida business, and co-operative companies. No accurate figures exist, but it is estimated that FARI companies account for approximately 80% of the fertilizer and 85% of the pesticide business in the state.

FARI was organized in 1932. At first the organization performed actual field and laboratory research. This was discontinued in the mid-1930's in deference to the public agencies' research programs in the state. About 1937, a group of pesticide companies sensed the need of an organization and requested permission to join the FARI.

The two groups have worked harmoniously ever since—cooperating on matters of joint interest (which are numerous), and working separately, but through the FARI, on matters which are strictly of a "pesticide" or "fertilizer" nature.

The Institute is formed on the premise that the fertilizer and

pesticide industries have a responsibility to help farmers to do a better job. In short, they believe what helps the farmer helps industry. The charter restricts the Institute from becoming involved in any commercial or political activities.

The paid staff of the Institute is quite small when compared with many other organizations. The secretary-manager of the organization is Mr. Frank L. Holland, who has served in this capacity since the Institute was formed. In addition to the secretary-manager, FARI employs an assistant to the manager, Bill Wilson; an office secretary, Mrs. Eleanor Wilson; a consulting chemist, Mr. R. P. Thornton of Tampa; and extra office clerical help as needed. Offices are located in the Philips Professional Bldg., Winter Haven, Fla.

Officers and directors are elected each year by the membership. The current president is Mr. E. Meade Wilson, Plant Food Division, International Minerals and Chemical Corporation, Mulberry; fertilizer vice-president is Mr. Lee Branan, Marico, Inc., Ocala; pesticide vice-president is Mr. R. H. Cooney, Flag Sulphur and Chemical Co., Tampa; and Dr. Irvin W. Wander, Growers Fertilizer Cooperative, Lake Alfred, is treasurer.

Meetings held by the Institute members are the "business meeting" type rather than "convention" type. The annual business meeting, held yearly about the

middle of the summer, is entirely devoted to business matters.

FARI frequently sponsors educational meetings—which are staffed largely by men from public agency, grower, and commodity groups. All fertilizer and pesticide manufacturers in Florida are invited to such meetings. FARI also cooperates with other organizations in co-sponsoring educational gatherings in specific fields.

This year the pesticide section of the Institute expects to have a separate business meeting during the winter. This has been made necessary by the tremendous problems concerning pesticides following the cranberry scare of last year, and the need for more time by the pesticide members to sit down together and work out these and other industry problems. The pesticide industry of Florida is taking the attitude that no stone will be left unturned with regard to proper recommendations, registrations, labelling, safety precautions, usage, etc., of pesticides.

*To understand the functions of FARI one must understand something of Florida Agriculture! Florida is a little unusual in that at its southern extremity such items as winter vegetables, avocados, and limes are the principal crops; while at the northwest extremity of the state, soybeans, wheat, cattle, and pine trees are the principal agricultural commod-*



E. Meade Wilson, International Minerals & Chemical Corp., Mulberry, Fla., is currently president of the Florida Agricultural Research Institute.

ities. The largest single crop in the state is citrus—this year's crop is estimated at about 90 million boxes of oranges, 30 million boxes of grapefruit, and 4 million boxes of tangerines. Probably around 80 million gallons of frozen orange concentrate will be manufactured from nearly two-thirds of the orange crop. Citrus residues from the orange concentrate and canned orange juice operation, grapefruit concentrate, sectionizing, and canning operations, and tangerine processing operations will be treated and dried to manufacture almost 300,000 tons of a product known as Florida Dried Citrus Pulp. This commodity makes a very excellent ingredient in cattle feed.

The Florida fall, winter, and spring vegetable crop is quite large—this business is second in size and value only to the citrus industry. Other agricultural industries in the state include the rapidly expanding ornamental horticultural industries—turf, nursery plants, foliage plants, cut flowers, garden supplies, commercial lawn spraying, etc.; the cattle industries—beef and dairy with accompanying pastures; the field crops and forest industries which are found primarily in north and west Florida; and the tropical fruit industries of limes, avocados, mangos, and lychees, which are found in the lower central and south Florida areas.

Florida's soils are exceedingly variable—its crops are grown in clay, pure sand, muck, crushed lime rock, or hundreds of various

blends of these four general types. Practically every element known to be limiting for plant growth has at one time or other been found limiting in Florida soils. Minor elements such as magnesium, manganese, copper, zinc, iron and boron are added in fertilizer or used in nutritional sprays almost routinely on many Florida crops.

Florida weather, too, helps complicate Florida's agriculture picture. Too wet, too dry, too hot, or too cold—all of these conditions may occur numerous times in any one crop season.

The widely different, and often high value per acre crops, and various growing conditions have helped result in formation of a large number of trade associations representing various commodity groups. For instance, citrus is represented by groups such as Florida Citrus Mutual (a growers organization), the Florida Cannery Association, the Citrus Processors Association, Florida Fresh Citrus Shippers Assoc., Florida Citrus Production Managers Assoc., and others. Vegetable and tropical fruit growers are represented by the Florida Fruit and Vegetable Association (FFVA); ornamental horticulture through the Florida Nurserymen and Growers Association, Florida Turf-Grass Association, the Florida Flower Association, and the Florida Seedsmen and Garden Supply Association.

The overall agriculture industry business in Florida is conducted by the many associations representing its various segments. FARI has accepted its responsibility, and has labored long and hard in cooperation with these other organizations for the betterment of Florida agriculture. FARI is active in the work of the Florida Agricultural Council—this is an organization of various Florida trade associations who band together to aid the agricultural public agencies of the state (including the College of Agriculture, the Agricultural Experiment Stations, Agricultural Extension Service, etc.)

in obtaining adequate general revenue monies from the state legislature so that these agencies can properly function to serve agriculture.

Other agriculture-industry organizations in which FARI is one of the active participants are the Agricultural Section of the Florida State Chamber of Commerce, and the Florida Conference Group. This latter group is a liaison type of organization of the various public agency and trade association groups which are interested in Food and Drug matters. The Conference Group was formed in the early 1950's when it became apparent that hearings would be necessary in connection with pesticide tolerance matters. Because of the large size of this organization, a Steering Committee was later formed to help facilitate the business of the group. At present, chairman of the Florida Conference Group is Provost for Agriculture W. M. Fifield, of the University of Florida; vice-chairman is Dr. J. R. Beckenbach, Director of the Florida Agricultural Experiment Stations; secretary of the organization is Frank L. Holland of FARI. Mr. George Talbott of the Florida Fruit and Vegetable Association is chairman of the Steering Committee; other Steering Committee members include Joe Fuller of the Florida Cannery Association (vice-chairman), Dr. L. G. MacDowell of the Florida Citrus Commission, plus members from seven additional organizations including the Farm Bureau, the Florida Dairy Products Association, Florida Citrus Mutual, Florida Packinghouse Managers Association, Florida Cattlemen's Association, and FARI.

FARI, like most organizations, functions largely through its committees plus the hired staff. FARI committees cover the various commodities and interests of FARI. Unless a committee is for a purely "fertilizer" or "pesticide" purpose, both fertilizer and pesticide people are appointed to it by the presi-



dent. For instance, the Fertilizer (or Pesticide) Industry Control and Standards Committees are made up of either fertilizer or pesticide members respectively; the Citrus Production Research Committee is made up of both fertilizer and pesticide members.

With regard to matters of purely a fertilizer industry nature, FARI has spent much time and effort through the years in cooperation with the Florida State Department of Agriculture and the Florida Agricultural Experiment Station in what is known as the Fertilizer Control Research Project. This project originated as a result of increasing deficiencies in manufactured fertilizers following World War II. Before the War, most grades carried considerable amounts of phosphate and natural organic materials. After the War, there was much demand for fertilizer with high analysis and little or no phosphate. During this period several new fertilizer materials possessing different and unique physical and chemical characteristics came on the market and added to the problems. (Also, during this period bulk fertilizer came into its own in Florida—particularly for citrus and pastures.) The high analysis, low (or no) phosphate grades were particularly troublesome when solid nitrogen and finely ground potash materials were mixed—an analysis of such mixtures often showed a nitrogen deficiency and a potash average. The resulting deficiencies caused much concern among growers and throughout the fertilizer industry. Fertilizer manufacturers knew the nitrogen in the mixes was not short. The question was, where did it go?

FARI through its Fertilizer Control Committee (as it was then known) joined with the State Department of Agriculture, and the Florida Agricultural Experiment Station in developing the Fertilizer Control Research Project to study all phases of fertilizer manufacture and control. FARI, under the pro-

Assistant Manager Bill Wilson (left) and Secretary Manager Frank Holland discuss a new bulletin pertaining to pesticidal residue tolerances.



ject, furnished the manufacturing plants and fertilizer mixer; the State Department of Agriculture furnished inspectors who drew official samples, and analyzed the samples. (FARI's consulting chemist also analyzed duplicate samples of the fertilizers.) The Florida Agricultural Experiment Station helped lay out the experiments, did the statistical analyses of the laboratory results and some of the sieve and chemical analysis work, and the agricultural engineering work on sampling devices.

The first results of experiments indicated the sampling tools could possibly be at fault, and a second set of experiments was laid out to study this situation. The results of the experiments to date have proved the following:

1. Most of the deficiencies were caused by *physical segregation* rather than chemical losses. (Until this time, the laws of physics had largely been overlooked in control matters.)
2. The official A. O. A. C. tools would not do a proper job of sampling. For instance, the Old Indiana Tube tended to form a compression cone which forced the larger particles (usually the nitrogen) in the fertilizer mix aside. This plus its small size of opening caused an excess of small particles (usually the potash) to be picked up.

The State of Florida on January 2, 1958 adopted new sampling tools to help correct the problem—the old Indiana Tube was replaced by the Large Indiana Tube, which works quite well in sampling bagged fertilizer.

3. Once bulk fertilizer is in a conveyance, no known tool will draw an accurate sample from it. However, it was here that the problem was solved by borrowing a technique from the phosphate industry. A Modified Belt Discharge Cup sampler was devised. It was found that by passing the cup evenly through the stream of fertilizer where it discharges at the end of a belt, an accurate sample can be obtained. Also, a Modified Belt Sampler cutting the stream of fertilizer on a moving belt will also take a fairly accurate sample. So the bulk sampling problem was greatly improved by drawing the sample at the belt or from belt discharge as the fertilizer goes into the bulk conveyance.

The fertilizer control committee of FARI is now known as the Fertilizer Control and Standards Committee, but its purpose has not changed, namely to continue

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# SULFUR:

## A MILESTONE IN FOOD ABUNDANCE

Referred to sometimes as the fourth element essential to plant life, sulfur serves several functions in plant nutrition: 1) it functions as a crop building element; 2) it affects root development; 3) it affects formation of bacterial nodules on the roots of legumes; and 4) it holds iron and magnesium in solution, affecting formation of chlorophyll.

A Common, commercially available form of sulfur is sulfuric acid, which, as such, is not a plant food, but is important for processing raw phosphate rock to produce normal superphosphates, and to combine with ammonia to produce sulfate of ammonia or to combine with potassium to form sulfate of potash.

IT was one late day of December 1894 in the marshes of Bayou Choupique, in southwestern Louisiana, near the Gulf of Mexico that an event occurred which was to have a terrific impact on world food production. On that day, Herman Frasch "suddenly stepped over to the pump and touched his finger to the polished rod which had begun to film over with some liquid. He held his hand up for all to see. His finger was smeared with yellow—sulfur—melted sulfur, pumped up from a vast deposit 500 feet underground. The miracle had come to pass."\* The Frasch process of recovering sulfur made possible the economic production of huge supplies of pure sulfur in the United States and broke the Sicilian monopoly in this commodity. How this event was to affect the agriculture of our country and influence food production and start a series of evolutionary changes in industry and farming should be better known. Sulfur and fossil fuel, that is coal and "coal oil" (petroleum), are definitely linked very closely to the astounding progress achieved by agriculture in the 20th century. "The

change in man's circumstances," says Dr. Hugh Nicol,\*\* "and in his relations with nature took shape about 60 years ago when, for the first time in history, mankind ceased to rely on sun, sea, soil and other surface features of the earth to produce all his food. Instead, a proportion of us began to make use of fuels and other fossil reserves to produce part of our food (as well as continuing to use fuel for producing energy external to our bodies)."

### Phosphates, sulfur and food

The heart of the problem of food-supply is a chemical one: The extra protein and other nutritional elements necessitated by the more than 50% increase in the population of the Japanese and white peoples since 1894, could not have been available—and the increase not possible—if chemical fertilizers had not been manufactured in appropriate amounts. This is especially true of the phosphatic plant foods. The ores of these fertilizers

have to be mined and processed—and to do these things requires fuels and sulfuric acid. The phosphates are of highest importance in providing increases in protein produced through the growth of legumes. Among the phosphatic compounds the chief is superphosphate, made by burning sulfur to produce sulfuric acid and causing this to react on raw phosphate rock." A third of our man-power and brain-power is sustained by sulfur . . . . Man's future depends on the supply of brimstone or its equivalent."\*\*

### Sulfur in agriculture

What are some of the distinguishing characteristics of this sort-of-neglected chemical element, sulfur, which make it of primary importance in food supplies and other socio-economic effects? Sulfur was known to the ancients: references to it are found in the Bible, in Egyptian, Greek and Roman literature. It was called "brimstone." Originally, the word designated the gum of the gopher tree and later was applied to other flammable substances especially sulfur, "the stone that burns." This gen-

\*Description of early test engineered by H. Frasch as described in "The Stone That Burns," 1st ed. by William Haynes Van Nostrand Co. 1942.

\*\*Food supply in Nuclear Age—Hugh Nicol. Bull. Inst. of Physics. Vol. 9, Jan., 1968. p. 7-13.

eral application of the word to so many combustible substances created confusion among chemists, and it was not until 1909 that Gay-Lussac and Thenard definitely established that sulfur is one of the chemical elements. We know now it is indispensable to the growth and health of plant life as well as to animal and human existence.

Agricultural workers are only now beginning to fully comprehend the essential role played by sulfur in crop growth. Perhaps complacency about its supply in soils has been engendered by the knowledge that many fertilizer materials applied to our soils contain substantial amounts of sulfur. Superphosphate, sulfate of ammonia and sulfate of potash are such materials. But crops remove from our cropland every year an average of close to 3 pounds of sulfur from each of the 370 million acres cropped. The late J. G. Lipman\* estimated that the annual loss in drainage waters amounts to over 40 pounds per acre. When he made his estimates in 1930, the average application of sulfur to cropland was at about 4 pounds per acre, and the net deficit (crop removal and losses by drainage and other means) amounted to some 29 pounds per acre. In time, this deficit may become a serious limiting factor in crop production, especially in areas where high-analysis fertilizers dominate.

#### Sulfur in crops

All crops contain some sulfur. The following summary is suggestive of the appreciable amounts removed by cropping.

Tomatoes, celery, onions, cabbage—consume large quantities of sulfur; in fact, larger quantities than they do of phosphorus. For example, the following percentage content on the dry basis confirms this:

|          | % Sulfur | % Phosphorus |
|----------|----------|--------------|
| Tomato   | 1.18     | 0.95         |
| Onion    | 0.95     | 0.36         |
| Celery   |          |              |
| (without |          |              |
| bloom)   | 1.81     | 0.16         |

#### by Vincent Sauchelli

Consultant Agronomist  
Baltimore, Md.

Alfalfa is also a particularly heavy user of sulfur, requiring about twice as much sulfur as phosphorus, while cabbage requires three times as much.

Sulfur in plants is distributed fairly evenly in the form of proteins, sulfates and volatile compounds. It functions as a building element: in proteins it is found in three amino acids: cystine, methionine and cysteine; and in at least two vitamins: thiamine or B<sub>1</sub> and biotin. Plant proteins vary in their content of sulfur, the range being 0.0003 to 7.2 per cent. Other effects in plants caused by sulfur are: (a) on the formation of chlorophyll; here the effect is to bring and hold iron and manganese in solution; (b) on root development; and (c) on the formation of bacterial nodules on the roots of legumes.

Crops seem able to absorb sulfur from the soil only as the sulfate ion, (SO<sub>4</sub>). Hence, for the sulfur of manures and other organic matter to become available to plants, it first has to be acted upon by soil microorganisms, which release it in the oxide form. 40 pounds of sulfur per acre per year. Soils normally contain some

#### Sources of soil sulfur

Plants have three main natural sources of supply of sulfur: soil, precipitation and air. Areas in the vicinity of certain industrial plants, particularly where coal is used as fuel, receive appreciable amounts of sulfur brought down in the precipitation: estimates indicate up to sulfur proportional to their organic matter. Prairie soils of the Middle West are relatively high in sulfur content, Coastal Plains soils and soils in the Pacific Northwest are usually low.

\*J. G. Lipman—Director N. J. Agri. Expt. Sta.

The increasing use of high analysis fertilizers, with relatively less sulfur in their composition, has led several state agricultural authorities to survey their sources of sulphur for crop use. The Virginia AES reported in 1957 that the amount of sulfur brought down by rainfall and snow per acre per year varied from 12 to 35 pounds, the larger amounts occurring near the large cities. "Much of this precipitation sulfur is either lost completely from the soil by leaching, or it accumulates in the lower depths of the soil." The following 8 states report that it is considered advisable to apply straight sulfur, in addition to that in fertilizers and as precipitation, to many areas within their boundaries: California, Florida, Idaho, Minnesota, Montana, Oregon, Washington and Wyoming.

#### Sulfuric acid and superphosphate

We are all prone to take many of our present-day, marvellous inventions for granted. How many ever give a thought to the importance of mineral acids in our national life? Very few, indeed. Yet the statement is true that a nation's living standard can be measured by the amount of sulfuric acid it consumes annually. In 1958, the U. S. A. produced more than 17 million tons of this acid, more than any other country in the world. And of this total, the fertilizer industry consumed by far the largest proportion, over 6 million tons or about 36 per cent. Although sulfuric acid as such is not a plant food, it is used for processing raw phosphate rock to produce normal superphosphate and to combine with ammonia to produce sulfate of ammonia and with potassium to form sulfate of potash. Plant foods are essentially soluble compounds of nitrogen, phosphorus and potassium. Generally these foods are prepared as mixed fertilizers. In the year ending June 30, 1958, American farmers consumed a total of 6,512,387

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## Lack of understanding; Residue laws - cited among

WE need to reverse our thinking—instead of calling agricultural chemicals pesticides, they should be referred to as crop protectants, R. D. Eichmann, Portland, Oregon, Stauffer Chemical Co., declared at the diamond jubilee meeting of the Oregon State Horticultural Society. He was addressing the apple and pear section of the four-day, two-day session at Oregon State College, Corvallis, Nov. 17 and 18.

Some 1,200 persons attended the various special interest sections which included also stone fruits, vegetable crops, and small fruits.

"It is obvious the elusive spider mite is winning the race with chemical control," Dr. L. C. Terriere, OSC associate insect toxicologist, commented in his talk on recent developments in the study of insect resistance, before the apple and pear growers.

In the Rogue River valley in southern Oregon, where is concentrated winter pear production in which Oregon leads the nation, mites have met and beaten at least 14 of the most toxic insecticides man has ever invented. Effective miticides available to growers in that area seem limited to two non-phosphate materials, Chlorobenzilate and Kelthane, and there are rumors these are showing signs of weakness, Dr. Terriere added.

It appears that there are two types of resistance, in one of which the level of resistance is reached in a few generations and does not rise appreciably after that, he continued. In the other, the level continues to rise with each generation and reaches heights many times greater than the starting point. In the field, the two types may blend so that an insect population may show almost any degree of resistance.

Physical barriers, such as increased cuticle thickness, fat deposits and similar protectants against insecticides, can become a

detriment to the insect if they increase too greatly. Detoxifying enzymes, another means by which insects escape death from chemicals, are being studied.

"As we learn more about the actual situation, we may be able to design a counterpunch for the resistant insect," Dr. Terriere told his audience. "We may find it possible to treat the resistant bug with dual toxicants, one which we could call the detoxification agent, designed to knock out the detoxifying enzyme. The second toxicant could then reach the sensitive site without hindrance."

Working with resistant strains of houseflies, scientists at Oregon State College have been able to isolate the enzymes which make the various fly sprays harmless to those pests. It has been learned that naphthalene, for example, is quickly modified in the fly's body into at least three new compounds, which are in turn converted into a total of nine more products which are excreted.

"It has been discovered that certain insects resistant to DDT convert it into kelthane," Dr. Terriere revealed, adding, "There must be a moral in all this, but I can't quite put my finger on it."

The almost limitless number of possibilities of further development in the organic phosphate group of insecticides offers hope that scientists can keep ahead of insect resistance by synthesizing new materials.

"One other problem also hinders progress in this area," Dr. Terriere declared in revealing pessimism concerning control of spider mites. "This is the bottleneck through which our modern pesticides must pass before we can use them. I'm speaking of the residue laws which slow the development of new materials and which actually discourage manufacturers. This problem alone may prevent our taking advantage of some

of the ideas which research on resistance is presenting to us."

Control of scald on d'Anjou pears, very similar in appearance to common apple scald, apparently is being achieved with ethoxyquin, according to another report made to the apple and pear group. Marketed under the trade name Stopscald, the material has kept fruit treated in a dip (4,000 ppm) almost entirely free from scald as late as early April. This was the report of Dr. Elmer Hansen, Oregon State College horticulturist, and Walter M. Mellenthin, superintendent of the Mid-Columbia Experiment Station.

This material has not been cleared for use on pears, and tests were conducted only during the past season, but "results obtained appear to offer promise," they declared.

Poor water management was responsible for many of the failures of herbicides to control weeds in strawberry fields, reported Dr. Richard M. Bullock, superintendent of the North Willamette Branch Experiment Station. In some cases the soil surface was permitted to dry out, immobilizing the herbicide, so it was unable to affect weeds which germinated in the moist ground beneath. In other instances, too heavy irrigations washed the herbicide down below the area in which the weeds were sprouting.

Chemical weed control in strawberry fields has cut costs in this operation from \$234 an acre to \$29 an acre, Dr. Bullock revealed, according to a report from one of the leading processors who discovered these extremes in a survey. Strawberries are a \$12 million crop in the lower Willamette valley.

Lack of understanding of the mode of action of herbicides is one of the main handicaps in obtaining satisfactory results with them, Dr. Bullock indicated. Failure to



## bottlenecks of industry at Oregon Conference . . .

appreciate the need for insisting on proper soil surface conditions is another, and "perhaps insufficient calculations of just how much one can afford to spend in providing conditions necessary to be able to take advantage of the things these chemicals can do."

In the latter category, Dr. Bullock commented that high money race horses paid off only on clear days and fast tracks, so, "If you can provide only a muddy track, put your money on a 'mudder,' or maybe you shouldn't even have entered the race."

Because weedicides and insecticides applied to the soil should be incorporated at different depths, it is generally not advisable to try to apply them simultaneously, he pointed out. However, there are several herbicides showing outstanding promise for use in this manner. Wider adaptation and residue studies to enable registration for use in this way will be emphasized during the coming season in the Willamette Valley, Dr. Bullock promised.

A satisfactory, workable, and easily adaptable program is available for weed control in cane and bush fruits, but it hasn't been widely adopted because of reluctance to replace an already established program. Chemical herbicides are reducing weeding costs markedly, but "of even greater significance would be the reduction of use or complete elimination of that destructive machine, the grape hoe," he declared.

Most growers have done a good job of supplying phosphate and potash to their fields, Fremont Sprowls, Multnomah County agricultural extension agent, commented in a panel discussion of soil testing for small fruit growers. Few have been aware of the shortages of magnesium and boron, which appear to be the limiting factors in red raspberry production in Multnomah County.

"One interesting response on a 15-year-old Washington field in 1960 was that plots receiving gypsum applications made a tremendous growth, much more than any adjacent rows," he reported. It remains to be seen what effect this will have on yield.

"What does all this mean to the farmer? In our area I think it means a change in the fertilizer program. For many it will mean a reduction in the amount of phosphorus and potash and increased amounts of magnesium and boron. It may not change the amount of nitrogen now used, but this should be watched closely.

"As limiting factors are removed, response often can be obtained by addition of other elements in greater quantity. Nitrogen may be an example."

Dr. Justus C. Ward, Washington, D. C., chief of the pesticides regulation branch, plant pest control division, USDA, addressed one of the general sessions as well as the apple and pear group. He forecast that the problem of drift from plane application of pesticides would be solved. However, we must be willing to make changes, because it seems too optimistic to presume that we can retain the "high-powered" pesticides and be able to restrict their spread simultaneously, he pointed out.

"The public has become fearful of all poisons, and some fatal accidents which have occurred with our pesticides have brought this class of useful chemicals into the center of the spotlight," Dr. Ward commented. "We are in a period of transition which will last for some time," he continued, advising the farmers, "The label will tell the story. Read the label and follow it precisely."

When local conditions cause an experiment station to advise growers to make applications of larger amounts of a pesticide than

are called for on the label, authorization to do so should be obtained from the processor. This was the suggestion of Frank C. Lamb, Berkeley, Calif., National Canners Association, who addressed the vegetable growers, small fruit growers, and the apple and pear section.

Residue analysis is the last line of defense against seizure for exceeding the tolerances, he pointed out. Many pitfalls await the unwary analyst, and dependence on unreliable analyses can be extremely dangerous. He suggested that all laboratories which are engaged in residue work run frequent checks with samples containing known amounts of pesticides as proof that they are operating efficiently.

Peeling a horticultural product ordinarily removes most of the residue, concentrating it in the peelings. As a result of recent regulations, this cannery waste no longer can be used for feeding livestock—or at least it is extremely hazardous.

Growers were also advised to keep careful records of their pesticide applications, the dates, materials used, and dosages. Contracts of processors with growers require them to present completed records of the pesticide applications made, and buyers on the open market may require the same. The farmers should be guided by the advice of their college experiment stations.

Processors are not trying to tell the growers what to use, but lists of what may be used legally, are providing them with a check and the maximum limits of each for the various crops. Compliance must be close to 100 percent—"failure of a few individuals can be disastrous," he warned.

Almost 90 speakers addressed the various meetings during the two days of the convention.



## Production Training for Fertilizer Plant Men

- Materials handling equipment accounts for a major portion of plant food losses.
- Cyclone dust collectors generally effective in removal of particles over 5 microns; wet scrubbers effective on particles in low micron range.
- For handling solutions, in order of preference: stainless steel, aluminum and black iron.
- Quality control needed to: obtain operating data, determine cost of a given product, ascertain efficiency of current processes, prevent monetary losses.

THE 1961 International Minerals & Chemical Corp. training clinics are about to conclude, with final sessions scheduled for December 12-13 in Tyler, Texas and Dec. 14-15 in Jackson, Mississippi. The clinics have been held in Minneapolis, Indianapolis, Baltimore, New York City, Raleigh, N. C., Toledo, O., Winter Park, Fla., Montgomery, Ala., and Kansas City, Mo., and have dealt with many questions in which fertilizer production plant superintendents would be interested: 1) Fertilizer Shrinkage, 2) Scrubbing and Dust Control, 3) Handling of Liquids, 4) Quality Control, 5) Plant Maintenance, and 6) Plant Supervision.

Members of IMC's technical staff, Richard G. Powell, James DeLong, and Charles Franklin, and IMC manager of merchandising, Neil Schenet, conducted the 11 production clinics, — answering specific plant production, maintenance and technical questions brought up by fertilizer plant personnel attending the meetings.

In discussing fertilizer shrinkage, at the New York City clinic, November 15-16, Richard Powell pointed out that this loss represents about 529,000 tons of fertilizer a year—almost the mixed fertilizer consumption in the state of Illinois. In terms of dollars, cost of shrinkage on raw materials alone is about \$17,000,000 annually. Sources of potential plant food losses were identified as:

- 1) Materials unloaded either to storage or to operation
- 2) Materials weighed and/or metered to operation
- 3) Material loss in process from: equipment, chemical reaction, dust, fumes
- 4) Product conveyed to storage
- 5) Product conveyed to bagging and/or bulk loading
- 6) Shipping

"This means," said Mr. Powell, "that materials handling equipment accounts for a major portion of our losses." Corrective measures which can do much to eliminate spillage include: use of a training program, shortening the routing of materials, installing an effective housekeeping program, putting on additional labor or adding equipment, noting causes of conveyor spillage and correcting.

Mr. Powell reviewed in detail materials losses that might result at each plant unit, — through inaccurate metering and feeding sys-

tems, inaccurate raw materials analysis (or by not taking into account raw materials analysis).

Indiscriminate use of excess amounts of sulfuric acid, — he cautioned, can frequently result in nitrogen loss, even though the original intention is to retain larger quantities of ammonia. "The problem of controlling internal and external dust losses," he continued "is undoubtedly the most exasperating shrinkage problem in the entire plant," introducing a report by James DeLong, which dealt with Scrubbing and Dust Control.

"Unlike most industrial air contaminants," plant men were told, "fertilizer dust exhibits all of the characteristics which make dust collection difficult. It is hot, moist, partially water soluble, corrosive, extremely fine, hygroscopic, disagreeable to the sense of smell, and has a tendency to stick to and build up on almost any surface.

Neal Schenet keeps the score on customer preferences for granular potash specifications as Richard Powell reads the reports from the floor at one of the 11 fertilizer production training clinics.



"The wide spread in particle diameter of fertilizer dust makes it difficult to select a piece of equipment which will provide high degrees of efficiency over the full range of dust particle size."

Mr. DeLong described the various types of dust collectors available, reporting on factors which influence the selection of dust collecting equipment for a fertilizer plant. "Cyclone dust collectors are perhaps the most widely used collection equipment in the fertilizer industry," he observed. "This is because it is the least expensive means of dust collection both from an operating and an investment viewpoint."

"Cyclone collectors," however, "are generally only effective in the removal of particles over 5 microns in diameter. This is equivalent to .0002 inches."

"Since many of the air pollution problems in the fertilizer industry involve complaints against ammonia fumes and the micro fine portion of the dust stream, many manufacturers are being forced to consider auxiliary collection equipment to remove these materials of less than 5 microns in size from the waste gas stream. They have turned to wet scrubbers which will do a collection job in the low micron range, where the dry cyclones are no longer effective."

Mr. DeLong reviewed the various factors concerning dust removal and collection in the fertilizer plant, — and the performance expected of the various types of dust collecting equipment. Factors influencing blower selection, — scrubbing equipment such as the

chamber scrubber, venturi scrubber, wet-cyclone scrubber, and the dynamic precipitator, — were discussed in detail. Mr. DeLong suggested that plant men should have engineering studies made of conditions in their plants, to determine what dust collecting equipment best suits their requirements. He also pointed out that IMC is equipped to conduct air velocity and  $P_2O_5$  studies for their customers, if they so wish.

What about dust collecting and scrubbing equipment costs? The cost of the collector per cfm of gas handled, reported Mr. DeLong, "will vary with the gas volume involved. The smaller the volume, the higher the cost per cfm. Cost of each type of collector will vary as a result of different materials and weight of construction. In general, dry cyclone dust collectors will cost 7 to 10¢ per cfm handled. The price of scrubbers for the 8-10,000 cfm range will range from 20 to 50¢ per cfm. For 20,000 cfm, they will cost 15-40¢."

#### Liquids in a Fertilizer Plant

"There is a choice of a wide and diversified group of liquid raw materials, each having its own individual characteristics," remarked Charles Franklin, in discussing the handling of liquids in a fertilizer plant. "We have alkalies and acids, liquids with critical freezing points and/or salting out temperatures, heavy viscous liquids, and liquefied gases with high vapor pressure. All of these liquids have their own peculiar corrosion characteristics, which have to be taken into consideration."

The combination of ammonium nitrate and anhydrous ammonia gives these liquids unusual corrosion characteristics. The free ammonia in the solution readily attacks materials made from brass, bronze, copper or any of its alloys, and the ammonium nitrate makes the liquid corrosive to black iron and steel. "Although most nitrogen suppliers now add corrosion inhibitors to retard the corrosive properties of nitrogen solutions," remarked Mr. Franklin, "it should be emphasized that the inhibitors only retard or slow down the corrosion rate."

"In regard to the proper materials for handling solutions of all types, the order of preference is stainless steel, aluminum and black iron. Due to the high cost of stainless steel, and the corrosive nature of solutions to black iron, aluminum is recommended as the most satisfactory material for handling and storing nitrogen solutions. Likewise, due to the high cost of stainless steel valves, diaphragm valves are recommended for solution service."

Suggestions on use and handling of anhydrous ammonia, lowering temperature of ammonia, handling sulfuric and phosphoric acid or phosphatic fertilizer solutions, piping and valves for these liquids, etc., — were discussed by Mr. Franklin.

"Extreme caution should be used in selecting any of the new plastics for sulfuric acid service," warned Mr. Franklin. "PVC pipe, which is finding acceptance in nitrogen solution and phosphoric acid service, is not acceptable in sulfuric acid service," — due to the dehydrating effect of sulfuric acid. Rubber hose should never be used for this service, he recommended.

Metering equipment was another phase of Mr. Franklin's comments, — including discussion of the Rotameter, Positive Displacement Meters and Magnetic Type Meters. Mr. Franklin concluded his remarks with a discussion of sparger design, — how to determine

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Panel answering questions on technical and production techniques in the plant food industry consisted of (left to right) Richard Powell, Charles Franklin, and James DeLong.

**Eastern Entomologists Discuss: Responsibilities  
with respect to residues; current pest control  
problems, — Pesticide registration requirements**

A DISCUSSION of the responsibilities of different agencies with respect to insecticide residues highlighted the 32nd annual meeting of the Eastern Branch, Entomological Society of America, held October 27, 28 in the Hotel New Yorker, New York City. Reflecting the position of the land grant colleges, Ordway Starnes, associate director, New Jersey Agricultural Experiment Station, observed that the first responsibility of the land grant college is to education. The state experiment researcher must conduct some experiments under local conditions so that local recommendations can be made. He pointed out, however, that the experiment station should be provided with data on preceding investigations and resulting residues. An approach to the problem, he suggested, might be to pool research on a national basis. Some attempt must be made to improve the methods of dissemination of such information, he feels.

Mr. Starnes indicated that another responsibility of the land grant colleges is to see to it that recommendations are followed enthusiastically, and that growers who observe such recommendations are protected. The colleges should also convey to the consumer the message that food in America is inexpensive and wholesome,—because of pesticides.

Discussing the effect of pesticides on warm blooded animals, Geoffrey Woodard, pharmacologist, Woodard Research Corp., Herndon, Va., reviewed the interrelationship between toxicology and analytical methods required. Where economic animals are involved, consideration must be given to:

1) the effect on reproduction; 2) effect on egg production; 3) appearance of chemicals in edible tissues; and 4) the appearance in meat. Furthermore, special considerations in the analytical methods involved, include: 1) sensitivity of the method; 2) application areas (plant tissues, tissue residues, milk residues); 3) reproducibility of methods (without exotic equipment); 4) applicability to state and federal control laboratories.

Responsibilities of the Food & Drug Administration were outlined in a report prepared by J. L. Harvey, FDA deputy commissioner, and presented by Mr. Clark in his absence. Legal actions are the responsibility of FDA if tolerances are exceeded, was the observation. It was pointed out that methodology has become increasingly important. More emphasis is placed on methods, and specificity of the method each year . . . for one thing because it is most important to have a means of checking to see if the law has been broken. One observation concerning carcinogenic materials is that no tolerance can be set until a safe residue can be determined. Who should pay the cost for studies involving pesticides on minor specialty crops was one question directed by ESA members to G. E. Lynn, Dow Chemical Co. This speaker observed that in some cases manufacturers have paid this expense,—and at other times residue data is obtained by experiment stations or the USDA.

ESA members, in an open discussion asked for a definition of the terms "Zero residue tolerance" and "No residue tolerance." Mr. Clark of FDA pointed out that a "no residue" tolerance requires

that sufficient data must have been submitted to show that a residue does not remain when the product is used exactly as recommended. Justus Ward, USDA, explained that the "no residue" basis is essentially an understanding between the manufacturer and the Department of Agriculture. Furthermore, that a "no residue" term is applied by the Department of Agriculture,—and that in uses of this type, judgment is shared by the Department of Agriculture and the manufacturer. In the case of a "Zero Tolerance," continued Mr. Ward, the term is applied when FDA has taken formal consideration.

"As far as actual use is concerned," said Mr. Ward, "there is no real difference.

Of special concern to ESA members is a question concerning enforcement of pesticide laws by state agencies,—members therefore passed the following resolution with the request that it be taken up at the national ESA meeting, scheduled for November 30-December 1 at Atlantic City, N. J.

"Whereas the regulation of pesticide uses within a state is primarily an agricultural concern, be it resolved that the Eastern Branch of the ESA, recommend that the enforcement of any state regulations of pesticide uses be primarily the responsibility of an agricultural agency in the state concerned."

**Elect Grayson Chairman**

The Eastern Branch ESA announced plans to hold its 1961 meeting at the Lord Baltimore Hotel, Baltimore, Md., October 30-31,—and the 1962 meeting on Nov. 1-2 at the Benjamin Franklin Hotel in Philadelphia.

James McD. Grayson, Virginia Agricultural Experiment Station was elected chairman for 1961, and Howard Baker, USDA, was elected vice-chairman. Leland G. Merrill, Jr., Rutgers extension entomologist, was re-elected as secretary-treasurer.

**Granular Systemic Insecticides**

In technical sessions during the two-day meeting, discussions



dealt with pests of shade trees and ornamentals; pests of fruit, vegetables and field crops; biology and toxicology.

A paper by P. H. Schwartz, C. E. Osgood and L. P. Ditman, Maryland Agricultural Experiment Station, reviewed tests conducted at the University of Maryland Plant Research Farm in 1960 on potatoes, lima beans, and sweet corn to determine the effectiveness of several granular systemics.

Investigators Schwartz *et al* reported, "The granular insecticides phorate and Di-syston applied in the soil at planting time were effective against potato leafhoppers, flea beetles and potato beetles on potatoes; potato leafhoppers, and Mexican bean beetles on limas; and flea beetles on sweet corn. The granular nematocide cynem gave nearly 50% reduction of first brood European corn borer larvae in young, sweet corn.

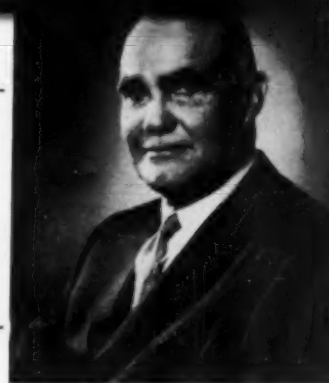
"In general, yield increases of potatoes resulting from treatments of granular insecticides at planting time were not satisfactory. Potatoes receiving foliar treatments of phosphamidon and Thiodan significantly out-yielded check plots. Yields of shelled lima beans were not significantly affected by insecticidal treatments in this experiment. Yields of sweet corn were consistently increased over untreated checks, but were not significant at the 5% level.

#### Dairy Barn Fly Control

Cornell University researchers, J. Matthyse, J. Foulk, P. Ode and J. Marshall discussed the residual activity and resistance development in dairy barn flies. They advised that, "Residual sprays of Dimethoate and Bayer 29493 at 1/2% or 1% gave 3 weeks excellent house fly control in dairy barns. Dimethoate gave good control for 6 weeks, and fair but acceptable control for the remainder of the season (12 weeks). Bayer 29493 barns were more heavily infested by houseflies beyond 3 weeks, but there was fair, acceptable control for the whole season.★★

### Pesticide Industry Responsible for showing farmers how to use its products - - A. E. Forster

Hercules Powder Co.



**A**N agricultural chemicals firm must be part educator if it is to stay in business today. It must convince the public that, thanks to chemicals, "our food supply is the most wholesome and sanitary ever known," and it must continue to show the farmer how to use those chemicals, Albert E. Forster, president and board chairman of Hercules Powder Company, said in a talk, Oct. 26, before the Societe de Chimie Industrielle in Barcelona, Spain.

"I prefer to think the attitude of critics of pesticides," he said, "is merely the age-old inclination of man to fear and distrust the new and unknown, and will disappear as the public receives the truth from reliable sources."

Nevertheless, he added, it is a very real problem and calls for a carefully thought-out program of information and education on the nature and use of chemicals for agriculture. This will be especially true, Mr. Forster said, in areas where the introduction of new chemicals will represent a true revolution in methods that may have been practiced for centuries without change and where most of the populace has had little, if any, formal education.

The problem of showing farmers how to use chemicals was the main topic of Mr. Forster's talk. "You may protest," he said, "that field demonstrations and farmer education are not exactly the forte of the chemical industry. But local, state, and government workers in agriculture—no matter how dedicated they may be—cannot do this tremendous job alone in the time it must be done."

To get the job done, he

added, the ranks of industry must be strengthened with more entomologists, plant pathologists, plant physiologists, agronomists, and toxicologists. Mr. Forster recalled that in taking a "practical cotton insect control program" to the cotton farmer, Hercules found that good communications were the prime requirement, and that it could be met only by these specialists who could "talk to their professional counterparts in government and research, and to the farmers in their own language." (For two years, (1957-1958) Hercules conducted a large-scale program, in areas of the cotton belt where boll weevils were most numerous and hardest to control, to demonstrate the effectiveness of toxaphene in controlling pests of cotton.)

Neither Hercules nor any other chemical company could have attempted such work, Mr. Forster said, with even the most brilliant chemists and chemical engineers. Many years before, he said, we learned that we needed to bring "agriculturists" to our staff.

During the season just passed, Mr. Forster disclosed, more than two-thirds of the cotton farmers in the Randolph County, Georgia, area switched to the toxaphene program that had been demonstrated in Louisiana and Texas. At this moment, he said, in an area where cotton was almost abandoned, Randolph County is harvesting one of its best crops in history, production costs have been lowered, and half a million dollars of income is being added to the economy of that county. The program now is being applied in a similar form internationally, Mr. Forster added.



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| National Plant Food Institute                | June 33  |
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| Niagara's Success, Flexibility Key to        | May 30   |
| Nitrate Process and Plant, New Potassium     | Aug. 35  |
| Northeast Fertilizer Safety School           | Sept. 45 |
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| Pesticide Registration Laws in Central and South America | Nov. 47  |
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| Sales, Pesticide — Dow Survey                               | Sept. 40 |
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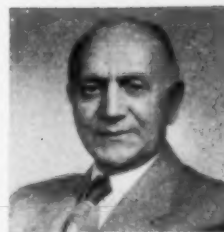
# — W X Y Z —

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| WACA Meeting, Report of                                                | Apr. 67  |
| WACA Meeting — Urges Modification of Laws Governing Pesticides on Food | Oct. 53  |
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## Fertilizer Views and News



by Vincent Sauchelli

Dr. Sauchelli is a Consultant to the Agricultural Chemicals Industry.

### New Materials, New Grades, New Headaches

*"The old order changeth,  
yielding place to new."*

—Tennyson.

TIME was when life was fairly simple for the men in fertilizer factories. Dry mixing various solid materials resulting in a bulky, non-caking product then constituted the main function. Superphosphate was made in the simple manner established by Lawes in England in the early 1840's. Our industry's technology was quite static. Then World War I burst upon the scene, and with it the beginning of dynamic changes. Synthetic ammonia, born in war-time, proved a tremendous stimulus, post war.

Changes really began in the 1930's. In 1936 the Davison Chemical Company produced the first commercial granulated superphosphate and granulated, homogeneous fertilizer mixtures. Ammoniation of superphosphate, alone and in mixtures, was started in that same decade. But a trend to ammoniation and granulation did not develop until after World War II. The first modern granulation plant started operation in 1950 and since then a major trend has set in to granulation. Production in the United States is currently estimated at between 4 and 5 million tons annually. It will steadily keep increasing. Farmers prefer granulated fertilizers, especially in precision application with powered distributing equipment, because of their freeflowing qualities.

#### The Ortho Phosphates

The past 15 years have ushered into use many new more highly concentrated fertilizer raw materials produced by processing phosphatic, nitrogenous and potassic ores and compounds. The list of phosphatic materials in use and about to be made available is symptomatic of the innovations: triple superphosphate, dicalcium phosphate, mono- and di-ammonium phosphates, phosphoric and superphosphoric acids, and the metaphosphates, calcium-, potassium-, and potassium calcium pyrophosphate.

Triple superphosphate, 46-48%  $P_2O_5$ , is rapidly winning an important place for itself and in many sections is displacing normal superphosphate. Agronomically it has a good record.

Phosphoric acid, 54 to 78%  $P_2O_5$ , is gaining acceptance in the trade. It readily combines with ammonia to form ammonium phosphates. Two grades are available. Wet process phosphoric acid is at present more popular than furnace acid owing to its lower cost per unit of  $P_2O_5$ .

Superphosphoric acid, about 76%  $P_2O_5$ , has been produced on a fairly large scale by TVA. It has been used successfully in pilot plant work to produce several solid and liquid fertilizers such as 12-36-0, 6-18-6, and 7-21-7 solutions. This acid shows real promise as acceptable material for the future.

Dicalcium phosphate is a relative newcomer and is present in the nitric phosphates. In many

field trials it has produced good crop yields when acid soil conditions favored it.

#### The Metaphosphates

The comparatively high phosphorous content of the metaphosphates has created great interest in them among research groups. They dissolve and hydrolyze gradually in a soil, and thus release phosphorus less rapidly than the orthophosphates. That they will eventually develop into acceptable, economical materials for manufacture of high analysis fertilizers is generally admitted among investigators.

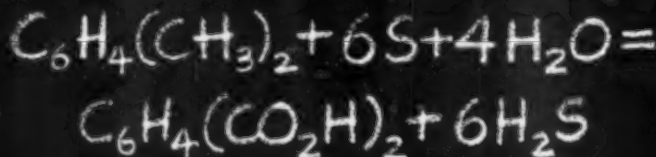
Calcium metaphosphate, 60 to 64%  $P_2O_5$  and 18% calcium, has already been produced by TVA on a large scale for test demonstrations. It is only slightly soluble in water, but soluble in ammonium citrate solution which puts it in the available phosphate classification. It is rated agronomically on a par with triple superphosphate in increasing crop yields.

By reacting a dry  $P_2O_5$  vapor with ammonia gas at high temperatures, TVA produced in pilot plant work solid compounds of the type 17-73-0 and liquid type 12-36-0; most of the reaction products thus being ammonium metaphosphate,  $NH_4PO_3$ . In field tests it has proved to be a good source of nitrogen and phosphorus plant foods. We shall probably hear more about this product. Already rumor has it that at least one company is planning commercial production; although TVA does not be-

(Continued on Page 91)

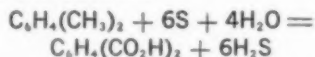


# NEW ROUTE TO PHTHALIC ACID!



**SULPHUR**  
helps to create  
headline products

In a report to the Petroleum Division of the ACS, Dr. William G. Toland of the California Research Corporation recently announced the development of a new method for producing Phthalic Acid, with the following over-all reaction:



Note that the presence of Sulphur right smack in the middle of this reaction is necessary for its completion. The Sulphur leaves the process at this point. The hydrogen sulphide can be oxidized to elemental Sulphur and returned to the initial reaction. It is thus operable in a closed cycle.

According to Dr. Toland, who developed this new route to phthalic acid, the process is simple and capable of high recoveries.

Here is another good example of how strongly Sulphur is in the processing picture. Together with its many derivatives it enters into countless reactions.



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Okotoks, Alberta, Canada



## PRODUCTION ROUND TABLE



by Robert E. Robinson  
*Atlanta Utility Works  
East Point, Georgia*

### EQUIPMENT MAINTENANCE: A TROUBLESHOOTER'S CHECK LIST

**T**HE first requirement for successful equipment maintenance lies in regular cleaning and inspection. Many fertilizer plants have regular maintenance crews but many do not. Either way, an alert, inquisitive attitude on the part of the foreman, superintendent, manager, plant engineer, and owner can contribute to the saving of many dollars. How? By the use of the five senses as instruments of inspection.

The first step is to know what to look for. By spotting troubles early and taking prompt, preventive

measures, unnecessary wear and damage to equipment can be avoided, breakdowns and loss of production can be forestalled, and often safety can be preserved. All of these lead to lower total operating costs and money saved.

This check list proposes a few categories of observations which might suggest useful approaches. Some items are obvious, but perhaps some may be new thoughts.

#### GENERAL OBSERVATIONS APPLICABLE TO MOST EQUIPMENT

##### 1. Visual Indications

Smooth running  
Irregular running, jerking, shaking  
Heavy laboring, straining  
Looseness of bolts, nuts  
Cracked castings, welds  
Bent parts  
Worn or abraded parts  
Evidence of rubbing or scraping

##### Possible Conclusions

Normal Condition should be known  
Probably abnormal  
" "  
Obviously abnormal  
" "  
" "  
" "  
" "

##### 2. Aural Indications

Steady, consistent running noises  
Electrical hum or whine  
High pitched scraping sounds  
Irregular bumps, clicks, whines, growls, or changing roars

##### Possible Conclusions

Normal Condition should be known  
Possible abnormal electrical conditions  
Possible metal to metal contact — may indicate need for adjustments  
Probably indicate defective parts which should be investigated promptly

##### 3. Indications to the Sense of Touch

High temperature (excessive heat generation)  
Electrical leakage or tickle  
  
Vibration, bumping, jerking, swaying, trembling, loping

##### Possible Conclusions

Possibly abnormal requires knowledge of equipment or component part  
Dangerous electrical circuit conditions such as inadequate equipment ground, failing insulation, loose connections  
Normal condition must be known  
If, with regular frequency or period, a numerical analysis may lead to the trouble, such as one bad tooth in a gear

##### 4. Indications to the Sense of Smell

Smoke or burning smell  
  
Chemical smells  
  
Residual smells

##### Possible Conclusions

Probably abnormal; electrical fire, burning oil or grease from frozen bearing, packing or seal  
May indicate abnormal process conditions such as loss of ammonia; normal conditions must be known; also may indicate leakage in pipes or tanks  
May indicate the history of a part and by comparison may indicate condition of a part or material

**PART 2 — NEXT MONTH**  
Analyzing performance failures of particular items of equipment



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many things, the distributor will tell you about the *certified* hopper load that's greater than any other aircraft of its type. You'll hear about the spray system. And the solids system. The oversized disk brakes. The interchangeability of upper and lower wing panels. The interchangeability of all four ailerons, too. And the cockpit area and seat belt are stressed for 40 G's . . . plus the fact that the same rugged, money-making Ag-Cat is now licensed for engines of 220 HP to 450 HP . . . and also that this airplane is a production item with *tooled construction*. Spare parts will never be a problem.

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# *Applicator*

- Comparing Application Methods
- Florida Horticulturists Meet
- NATA To Meet
- American Dusting Company

*Pilot receives detailed instructions on the day's flight plan from Clint Frye, while his plane — one of fifty in the American Dusting fleet — is serviced. Story on Page 59.*





# SEVIN<sup>®</sup>

INSECTICIDE

a "natural" for  
aerial applicators



**The new low price** of SEVIN in 1961, plus its many practical advantages in insect control, make SEVIN insecticide ideal for aerial applicators. Check all the special benefits shown below. When insects attack cotton, fruit, beans, vegetables, corn and other crops, it pays to "Sock 'em with SEVIN!"

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—even with resistant insects.

► **Less irritating**

in sprays or dusts. Just use normal precautions.

► **Handles easily**

Use recommended operating practices for superior insect control.

► **High stability**

SEVIN maintains potency in storage and carryover.

► **Safer to use**

No special protective clothing is needed. SEVIN contains no phosphorus. Less hazard to field workers and farm animals.

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# Comparing Application Methods

**Selection of the best method of applying an insecticide and of the best machine are among the most important responsibilities of an applicator. A primary requirement in application is to get insecticide onto the crop. Since the chemical is expensive, this should be done with as little waste as possible.**

**On low-growing crops, for example, the least waste often occurs with small-volume sprays.**

*This article is taken from a report on the application of insecticides by R. J. Coursee, National Institute of Agricultural Engineering, Bedfordshire, England. The complete paper appeared in the "Annual Review of Entomology," Vol. 5, 1960.*

COMPARISONS between different application methods show how effective biologically the methods are and also provide information on the physical performance of the application machines. The cause of any biological difference might then be identified with physical differences. Physical differences might be common to a number of machines. If an important effect is found to be general, a principal of application can be established which may then be utilized in another situation.

An example will help clarify this. If, say, it is found that a fine spray is ineffective in controlling a certain pest under particular conditions, several reasons for the failure could be suggested. But, if simultaneous measurements are made of how that spray fails to become available, it might be found that evaporation of the carrier liquid is to blame. Then, evaporation of equally fine spray of other carrier liquids of similar volatility might be expected under similar conditions. What machine or what insecticide is used might not then be relevant. The underlying physics are of wider value if valid generalizations can be made.

There are dangers (including naive rationalism) in attempting to generalize in this way from spe-

cific examples, for exceptions can sometimes be found. In this example, a deliquescent insecticide might upset any simple theory but generalizations which are nearly always true still are helpful. An attempt, therefore, has been made to generalize from the data which is available. The alternative would be to report factual examples, but not make any attempt to speculate about the principles that they might demonstrate. Such factual reporting of any subject often is preferred for the reason that an ounce of fact is worth a ton of theory.

However, pure reporting is not yet possible in the subject of insecticide application for two reasons. The first is an extreme lack of data. Although there are many biological comparisons between two sorts of machines, there are extremely few which also provide information on the insecticide recovery and its distribution on the pest or the host. The second is the difficulty of obtaining generally valid field data in the subject of application. For example, suppose it is desired to consider the suitability of a certain machine for the control of an insect. It might be possible to quote one particular relationship between the distribution achieved by it on a certain

occasion and the control obtained. But this would be a true relationship only for the particular circumstances. Machine setting and the way the machine was used, weather and crop conditions, and still other factors would all need to be specified before the data could be significant in a general way. These two reasons—firstly that there is little data at all and secondly that even where it exists it is not often sufficiently detailed to be interpreted—prevent an empirical approach to the subject of insecticide application at present.

On the other hand, if application is considered separately from the biological effect of the insecticide applied, there is some evidence. For instance, there is information on the range to which an air stream can penetrate the wind to reach a tall crop. No matter which insecticide is being applied against what insect, this information on application alone is of general use when it is necessary to propel a chemical to the top of a tall target.

The three main ways in which insecticides are applied are run-off spraying, small-volume spraying, and dusting. Run-off spraying is the ideal form of large-volume or high-volume spraying. A sufficiently large volume of dilute spray is applied to saturate all the crop surfaces. A certain amount of spray, called the maximum initial retention, is retained and surplus quantities drain off. Accordingly, all the crop surface comes in touch with insecticide. Often the deposit density of insecticide obtained is proportional to the concentration of insecticide in the original spray, but independent of the volume of

*(Continued on Page 93)*

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New Catalog gives full details.

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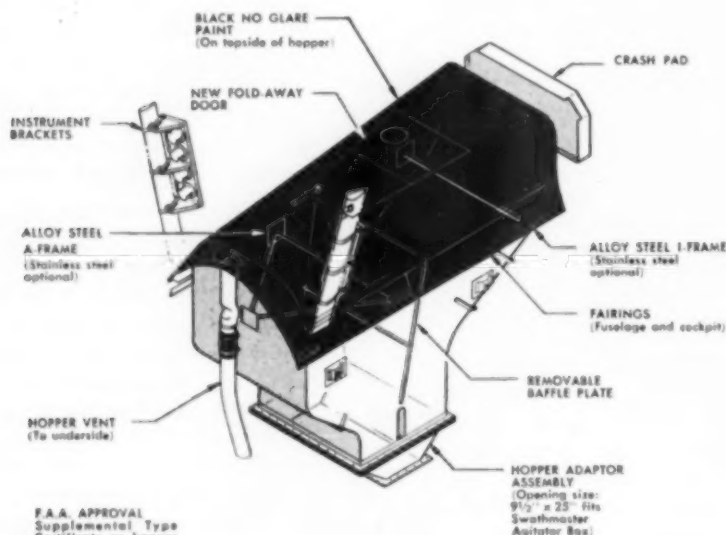
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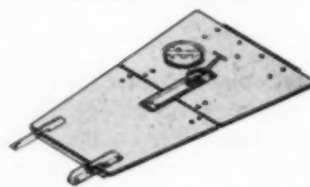
Lowest price possible for use with dry materials only. Inner walls primed and ready for do-it-yourself liner.



F.A.A. APPROVAL Supplemental Type Certificate on hopper construction and installation expected shortly. Details similar to already approved 165 and 185 gal. Transland hoppers.

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## NEW FOLD-AWAY LOADING DOOR



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### 1. FULLY CLOSED

Over center vise clamp latch and underside door flanges positively lock door in flight.



### 2. PARTIALLY OPEN

You can fold door up and forward without it slipping or without damaging door O-ring seals.



### 3. FULL OPEN

Completely out of way for loading or hopper cleaning.

Door is comprised of two one-piece aluminum castings. O-ring seal encloses all four sides each panel. Top side is painted with anti-glare black. Underside treated with anti-corrosion coating.

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Five planes of the American Dusting fleet fuelling up for an early morning scramble over large cotton acreage in Lynn County, Texas. Before nightfall, the planes will have dusted more than 1500 acres.

## American Dusting Company Projects One-Plane Operation to Include 11 Affiliated Distributors

FOR an industry to have experienced, in less than 20 years, such great advances in overall size and public acceptance as has the aerial application industry, it obviously must have been originated to fill a vital need on the part of its customers. An example of this need, and one of the companies which helped to meet it, can be found in the cotton-growing region of Oklahoma and Texas.

In 1944, the cotton crop in Caddo County, Oklahoma was virtually destroyed by infestations of boll weevils, despite the efforts of Clint Frye, a private flier and airport manager at Anakardo, Oklahoma, who tried, without success, to sell the idea of saving the infested crop by means of aerial application.

By 1945, however, with warnings of another heavy boll weevil infestation in mind, cotton farmers were willing to try Mr. Frye's plan. Accordingly, he purchased a surplus Stearman PT-17 and went to work. Except for refueling and loading, Mr. Frye and his pilots kept the plane in the air during every minute of daylight until the job was done. In just two weeks they had dusted one-third of Caddo County's 13,000 acres.

Careful examination of the fields indicated excellent control of all insect pests. A second dusting, followed late in the season by a defoliant application—also a relatively new idea at the time—turned a pessimistic outlook into

a good cotton year. Crop yield was well above average, and so was the quality. In addition, Mr. Frye found himself with a new career.

He founded the American Dusting Company and soon had more business than he was able to handle. In 1949 he was joined by Bob Erwin and L. H. King and the company headquarters were moved to Chickasha, Okla. The company's story has been one of practically uninterrupted growth. American Dusting now is affiliated with eleven different independent contractors that are located in strategic points in Oklahoma and Texas so that a plane can be put into the air at a moment's notice.

To keep its planes in the air and to provide efficient service American Dusting operates its own repair shop where any part of an airplane, including its engine, can be totally rebuilt. This, no doubt, is one factor to account for the company's enviable safety record. In its 15 years, there has been but one fatality and no injuries. During 1958 and 1959, its pilots flew 10,000 hours without a single lost time accident.

American Dusting's interest in aerial dusting, spraying, and seeding has led the company to take an active part in the development of the technique and as a source of supply to other applicators. A division, AMDCO Agricultural Chemicals, acts as a distributor for insecticides, herbicides, and defoliants in the Southwest.

What started out as a one-shot job has become for Clint Frye, his partners, and some 100 others associated with American Dusting, a fulltime, life-long career. As Mr. Frye sees it, there is a lot of satisfaction in saving a bumper crop that might have been destroyed by insects if his planes had not been available.★

## N. J. Horticulturists to Meet

Farm labor problems will be discussed by a panel of experts at the 86th annual meeting of the New Jersey Horticultural Society in Atlantic City, at the Hotel Dennis on Dec. 5, 6 and 7.

The first day's program will be devoted mainly to apple production with talks on spray recommendations, mite control, mouse control, dwarf apple trees in modern orcharding, new varieties, apple scald, and marketing research.

John H. Barclay of Princeton, chairman of the N. J. Apple Industry Council, will report on its activities, and the N. J. Small Fruits Council will also hold its annual meeting on Dec. 5.

Fred Heringer, Oroville, Calif., will report on "Recent Experiences with Labor and Labor Unions in California Agriculture."

## Transland Equipment Catalog

An aerial applicating equipment catalog has been prepared by Transland Aircraft, Torrance, Calif., to describe the many types of equipment offered by the company to aerial applicators. Among the products described are Swathmaster hopper combination kits, large and small Swathmaster spreader assemblies, Swathmaster accessories, Transland hoppers, combination hoppers, and hopper accessories.

Also described are pilot controls for Swathmaster and conventional dispensing systems, Transland liquid systems, dry materials spreaders, and liquid systems accessories. The catalog, TI-19, issued Nov. 1, 1960, can be obtained from the company at 2600 West 247th St., Torrance.



## Panel to Discuss Application Topics At Annual Meeting of NATA Dec. 6

A PANEL discussion of topics of interest to aerial applicators is a feature of the 21st annual convention of the National Aviation Trades Association, being held December 6 to 8 in the Oklahoma Biltmore Hotel, Oklahoma City, Oklahoma.

Members of the panel are: Lloyd P. Nolen, Mercedes Dusting Service, Mercedes, Texas; Kenneth Messenger, Agricultural Research Service, USDA; Monte Pierce, Forest Service, USDA; J. R. Wheatley, Union Carbide Chemicals Corp.; J. H. Henley, Aero Agricultural Service; Paul Hursh, Hursh Brothers; and a representative of the Federal Aviation Agency. The panel will attempt to reach a decision on the advisability of NATA's continuing to seek the re-

quirement of an FAA Air Agency certificate for aerial applicators. Among the specific problems to be taken up concerning this controversial issue are: "How will it help the industry?" "What is NATA's objective?" And "Is there a better method of gaining it?"

"Should NATA seek an FAA agricultural pilot rating?" and the advantages and disadvantages of such a rating will be discussed. The panel also will consider what recommendations the NATA should make concerning government pest control contracts. Factors to be considered under this heading include the possibility of the government's expanding its internal use of aircraft for operations and the effect that curtailment of government programs can be ex-

pected to have on applicator operations.

Public relations, and what the NATA can do to improve them, will be an important topic, as will the role NATA can play in improving the safety of aerial applicator operations. The NATA treasury has made available \$700 for the purpose of improving safety and the panel is expected to determine ways in which the money can be used most effectively.

With an eye towards enlarging the variety of services offered by aerial applicators, the panel will discuss methods of influencing the USDA to increase its research expenditures in this field. In this regard, the panel will attempt to determine the opportunities for new or additional research.

Among other topics to be discussed during the meeting by various divisions of NATA are pilot training, airport operating problems, and maintenance problems.



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## Florida Spraymen Form Association, Elect Johnson

Charlie P. Johnson (left), Charlie P. Johnson Nursery & Spray Service, Miami, was elected president of the Horticultural Spraymen's Association of Florida for 1961. Also shown are three regional vice-presidents. (left to right) Bill Murray, Greenlawn Spray Service, Lake Worth, Fla.; Larry Nipp, American Power Spray, Fort Lauderdale, Fla.; and William McAllister, Miami Lawns, Miami. This is the first meeting of the newly organized group.



**"YOU** are engaged in an industry which requires that you use certain hazardous tools which, if used unwisely and with disregard for the manufacturers' recommendations, can inflict sickness as well as death on all forms of animal life, including the animal life selected for direct attack," John A. Mulrennan, director of the Bureau of Entomology, Flori-

da State Board of Health, told the first annual convention of the Horticultural Spraymen's Association of Florida, Nov. 3 to 5, at Miami Beach, Fla.

Mr. Mulrennan told the spraymen that they, as professional and business people who are under the direct scrutiny of the general public at all times, must adhere to the highest of business ethics and

set an example which will make the public aware that they are mindful of their actions, and that the health and welfare of the citizens is of paramount consideration.

Also on the program was Robert Billett, O. E. Linck Co., Hialeah, Fla., who discussed weed control. Good turf management, he said, is the most important factor in weed control. That is, he explained, we can make the control of weeds quite simple by proper watering, proper fertilization, and proper height of cut.

Chemicals are most effective, he said, when applied to young, rapidly growing weeds, since good coverage with spray is most difficult on large weeds or a dense stand of weeds. Moisture and temperature also were listed by Mr. Billett as important factors. Since warm, moist soil is conducive to micro organism activity, he said, the decomposition of some chemicals is more rapid under these conditions. Rates should be adjusted accordingly.

Charlie P. Johnson, Charlie P. Johnson Nursery & Spray Service, Miami, Fla., was elected president of the association for 1961. Three regional vice-presidents also were elected by the 200 spraymen attending the meeting. They are: Bill Murray, Greenlawn Spray Service, Lake Worth, Fla.; Larry Nipp, American Power Spray, Fort Lauderdale, Fla.; and William McAllister, Miami Lawns, Miami, Fla.

### Arizona AAA Meeting Jan. 12

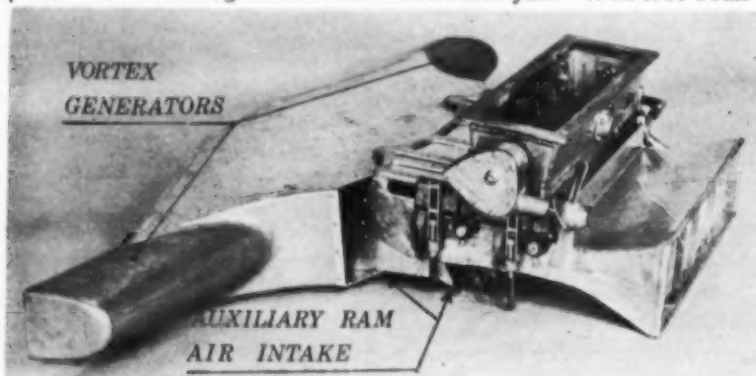
The Arizona Aerial Applicators Association Conference will be held at the Wigwam Resort Hotel in Litchfield Park, Arizona, Jan. 12 and 13, 1960. Included in the program is a demonstration of aerial application equipment.

### Specifications Folder

A 4-page folder on government specification finishes (primers, lacquers, enamels, dopes, and slushing compounds), has been published by Randolph Products Co., Carlstadt, N.J.

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## PEST ROUNDUP



by Kelvin Dorward

### Fall Armyworm Destructive Over Wide Area

THE fall armyworm was destructive over a wide area throughout October. Early in the month heavy infestations of the larvae were causing extensive damage to young small grains and turf grasses over the entire northern half of Texas. Damage was continuing in the central and north central part of the state by the latter part of the month. Some young grain was completely killed or damaged severely, and resowing was necessary. Populations of the insect ranging from 2 to 100 per square foot were reported from southern Oklahoma in early October. Later in the month, scattered infestations were reported throughout the State, with damage both in the southern and panhandle sections.

Destructive populations of the fall armyworm were found in scattered small grain and alfalfa fields throughout Tennessee. Controls were applied to several thousand acres of newly seeded alfalfa, small grain and pastures in the central part of the State. Fall armyworms were abundant and causing damage to fall-seeded wheat in the extreme southern area of Illinois. The insect was reported from Arkansas as being present in some fields of fall-sown small grain. In Alabama, larvae were found in grain sorghum in Lee County, in oats in the Tennessee Valley and in barley in Lauderdale County. Reports were also received from Virginia, but infestations were evidently minor.

The southwestern corn borer was taken the first time in Tennessee, in Shelby County, during September. Since the initial collection, the insect has also been found in Tipton County. In a recent survey in Arkansas the per cent lodging to corn, due primarily to the southwestern corn borer, was recorded as follows: north central area 4.3 per cent, northeast 4.4 per cent, east central 10.1 per cent and southeast 5.8 per cent. Although late corn represents only a small part of the total crop in Arkansas, in extreme cases 30 per cent or more of this crop lodged. This borer heavily infested the majority of the cornfields in eastern New Mexico counties and occasional infestations were found in roots of broomcorn and grain sorghums.

In the fall abundance survey for European corn borer in Cass and Richland Counties, North Dakota, 98 per cent of the inspected plants were found infested, with an average of 474 borers per 100 plants, the heaviest infestation ever recorded in the State. In Grand Forks and Traill Counties, the average infestation was 89 per cent, with 269 borers per 100 plants, a record infestation for these counties. The fall abundance survey in 15 West Virginia counties showed an average of 58 European corn borers per 100 corn stalks. In Virginia, the insect was taken for the first time in Bath County near Warm Springs.

Although the spotted alfalfa aphid was generally light from

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Mr. Dorward is head—Survey & Detection Operations, Plant Pest Control Division, U. S. Department of Agriculture. His observations are based on latest reports from collaborators in U.S.D.A.'s pest surveys throughout the U. S.

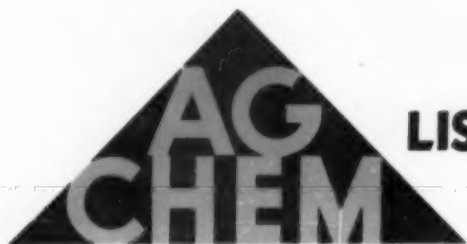
most states reporting in October, it continued to cause damage in some areas. Damage to alfalfa occurred in the Buttercreek and Cecil areas of Morrow County, Oregon. Injury was noticeable in fields in the Butler Creek area of Umatilla County and light populations were found in all alfalfa fields checked in Malheur County. Economic populations of the aphid were reported from Asotin and Walla Walla Counties, Washington. In Idaho, populations were on the increase, with counts up to 60 per sweep in 6-inch high alfalfa in Canyon County. Light populations were found near Lewiston, Nez Perce County.

In the central area of Arizona, the spotted alfalfa aphid increased in early October, principally on fields planted to susceptible alfalfa varieties. Heavy populations occurred in Oklahoma as far east as Claremore, but in areas of local rains, populations were on the decline. The insect continues to present a threat to fields of fall-seeded alfalfa over most of Oklahoma.

During October, the white-fringed beetle was reported from two states in which it had not previously been collected. One specimen was found on September 23 in Fulton, Fulton County, Kentucky. Eradicative measures were to be taken and additional delimiting surveys were initiated. In

(Continued on Page 90)





## LISTENING POST



by Paul Miller

### Aphid Control In Relation To Spread Of Barley Yellow Dwarf

**E.** A. Dickason, W. B. Raymer, and W. H. Foote (1), of Oregon State College, investigated the possibility of controlling the spread of barley yellow dwarf by the use of insecticides to control aphids. The virus that causes the disease is carried from plant to plant by several kinds of aphids. The disease has become increasingly important in western Oregon since 1954, when it was first found. In 1959, losses due to yellow dwarf in susceptible small grain crops in the region were estimated at 25%.

Several different insecticides were used. *O,O*-diethyl *S*-(ethylthio) methylphosphorodithioate (phorate) and *O,O*-diethyl *S*-2-(ethylthio) ethyl-phosphorodithioate (Di-Syston) in 5% granular formulations were broadcast on the surface and disced into the soil just before seeding. In carbon formulations they were used to treat seed. Emulsifiable concentrate formulations of a mixture of *O,O*-diethyl *S*-(and *O*)-2-(ethylthio) ethylphosphorothioates (demeton), and of *O,O*-diethyl *O,p*-nitrophenyl phosphorothioate (parathion) were applied to plants by spraying.

Hannchen barley was the test plant. Three plantings were made, on April 16, April 22, and May 13. Phorate and Di-Syston granules were used in all three plantings, phorate and Di-Syston seed treatment in the second planting only, and demeton and parathion sprays in the third planting only.

All treatments reduced the aphid population at first. Reduction in insect numbers lasted through the 5-leaf stage in the

earliest planting. In the two later seedlings, however, suppression of infestation up to this stage was less common. This effect may have some significance, since, according to Dickason and his associates, infection of cereal plants with the barley yellow dwarf virus prior to the 5-leaf stage results in severe stunting, discoloration, and reduction in yield.

Dickason and his associates reported very little difference between treated and untreated plots in percentage of yellow dwarf. In some treated plots, a delay in virus infection apparently allowed the plants to develop more vigorously and mature more normally. Yield in one such plot was up to 20% greater than in the adjacent untreated plot. However, all plants in all plots eventually became infected with the virus.

#### Control of Stripe Smut

R. J. Lukens and E. M. Stoddard (2), of the Connecticut Agricultural Experiment Station, obtained good control of stripe smut (*Ustilago striiformis*) by soil drenches with disodium ethylene bis-dithiocarbamate (nabam). They applied a 1:400 dilution of a 22% nabam formulation and a 1:2000 dilution of oxyquinoline sulfate to separate plots at 1 pint per square foot, in fall, in spring, and in both fall and spring. Oxyquinoline sulfate had little effect, but nabam reduced incidence of stripe smut. Time of application was not important.

#### DBCP Cotton Seed Treatment

John H. O'Bannon and Harold W. Reynolds (3), of the Crops

This department, which reviews current plant disease problems, is a regular feature of AGRICULTURAL CHEMICALS. The comments are based on observations of collaborators of the Epidemiology Investigations, Crops Protection Research Branch, USDA, Beltsville, Md.

Research Division, Agricultural Research Service, United States Department of Agriculture, report cooperative investigations with the Arizona Agricultural Experiment Station on the possibility of controlling the cotton root-knot nematode, *Meloidogyne incognita* var. *acrita*, by seed treatment with 1,2-dibromo-3-chloropropane (DBCP). When used as a preplanting soil fumigant, this chemical is effective against the root-knot nematode. Seed treatment, however, would eliminate the need for the special equipment and extra time required for soil application. Also, direct application to the seed would place the chemical in position to protect the developing root from nematodes in the soil immediately around the germinating seed. Nematocides in general are too toxic to be used for seed treatment, but DBCP had been found to be less injurious than others, at least to cotton seed under some conditions.

In two greenhouse experiments, O'Bannon and Reynolds applied technical DBCP to cotton seed at various rates. In one experiment, mean air temperature was 24.6°C; in the other it was 31.3°. Root-knot control and growth of surviving plants were good at both temperatures. Percentage of plants surviving, however, was much less at the higher temperature. For example, for seeds treated with DBCP at the rate of 2.15 pounds per acre, the average percentage of survival from

5 seeds per pot was 96.6 at 24.6° and 56.6 at 31.1°.

In two ground-bed experiments, the effects of temperature on germination of treated seeds under conditions similar to field conditions were studied. In one experiment, seedlings were grown at 32.7°C and in the other at 21.5° mean air temperature. Statistical analysis of results showed that at the higher temperature germination of treated seeds was significantly less than that of untreated seeds, whereas at the lower temperature germinations were not significantly different.

O'Bannon and Reynolds concluded that cotton seed treatment with DBCP would control root-knot nematodes without adverse effects on germination or growth at mean temperatures of 18° to 25°C during cotton-planting time, but that injury would result above 31°. They stated, however, that extensive field tests would be required before DBCP seed treatment could be recommended for control of cotton root knot.

#### Evaluation of Phaltan

The 3-spray schedule currently recommended for control of grape diseases in New York includes a ferbam spray for black rot (*Guignardia bidwellii*), and two later low-soluble copper and lime sprays for powdery mildew (*Uncinula necator*) and downy mildew (*Plasmopara viticola*). Insecticides are added to control the grape berry moth (*Paralobesia viteana*). According to E. F. Taschenberg and A. J. Braun (4), of the New York State Agricultural Experiment Station, this schedule is unsatisfactory in several respects, especially because each fungicide is limited in effectiveness and, since the two fungicides are incompatible, they must be applied separately. Also, the lime in the low-soluble copper fungicide decreases the effectiveness of some insecticides.

Taschenberg and Braun tested 50% N-trichloromethylthiophthalamide (Phaltan) to determine effectiveness and safety for grape dis-

ease control, residue on fruit and in juice, and effect on soluble solid content of the fruit.

The tests showed Phaltan to be effective against powdery mildew. In limited field trials it controlled black rot and downy mildew also.

No injury was associated with Phaltan in 1957 or 1958, but, in 1959, slight to moderate foliage injury occurred in all plots sprayed with Phaltan. The injury was evident in late July and became

most severe in mid-September. Comparison of environmental conditions with those in the preceding years indicated that the development of injury in the Phaltan-sprayed plots in 1959 was associated with hot dry weather and low soil moisture. Taschenberg and Braun considered that the usefulness of Phaltan against a number of grape diseases warrants investigation to determine its effectiveness at low concentrations and to find

(Continued on Page 90)

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## Washington Report



by Donald Lerch

**P**ESTICIDE manufacturers who like Washington, D. C. will be in luck in 1961. For, as it looks right now, they will have more opportunities than ever before to talk over industry problems and points of view with federal officials and members of Congress.

One reason is closer relationships now being built between industry members and members of Congress. The National Agricultural Chemicals Association is taking a leading role in this field. But there's another side to it, too.

We have learned that some wildlife enthusiasts are stepping up their efforts to promote legislation and regulations which would harass the industry and tend to hamstring a number of vital pest control programs.

An early fight next year likely will center around Rep. Leonard G. Wolf's "Chemical Pesticides Coordination Bill" which failed to pass in the last Congress. This bill would require federal pest control officials to consult with the U. S. Fish and Wildlife Service and with state wildlife agencies before starting any pesticide control program.

What causes people in pest control work here to raise their eyebrows is that this kind of consultation already is being done. Writing it into law would change the situation in only one major regard. It would give non-governmental groups and individuals stronger platforms for demanding public debate on pest control programs in states and localities. It also would provide more points at which they could bring in negative pressures to halt the programs.

Far from bringing more order and reason into pest control oper-

ations, the bill, in the view of many here, would open the door to repetition of outworn and discredited accusations against the Pesticide Industry and the USDA and lead to chaos in pest control work.

The anti-pesticide agitation whipped up during the hearings which led to passage of the Miller Amendment, and that during the gypsy moth hearings in Federal District Court in Brooklyn still are well remembered. Analysis of the Wolf proposal indicates that it would provide more issues around which anti-pesticide industry forces could rally and which they could exploit to poison the minds of the public with their own brand of misinformation.

Whether these opportunities would be taken up and exploited in this way, or whether the framers of the "Chemical Pesticides Coordination Act" themselves recognize the ultimate effect of the measure if enacted, are moot points. But there is little doubt that if the Wolf measure is passed, the opportunities would be there, and, judging from past experience, anti-pesticide fanatics would try to exploit every opportunity offered.

Aside from this specific issue due to come up early next year, the trend in Washington is toward more consultations, more meetings, and more federal involvement in issues which appear to affect large numbers of citizens with conflicting points of view.

The hope of many here is that more consultations at federal and state levels will result in fewer conflicts when products and programs reach the public. The price that has to be paid is more time spent

by Industry executives in Washington, D. C.

\* \* \* \*

Farm leaders here tell us that they do not expect any big, drastic farm program proposed from the new administration for some time to come, but when it comes it is likely to reflect city thinking more than farm thinking.

The reason they advance is that the farm states went almost solidly for the Republicans in the election, and rejected the stringent farm program proposed by President-elect Kennedy.

Beyond that, Congress still will be controlled by conservative Democrats and Republicans in positions to block any drastic proposals that might come from the White House.

What is in sight, these farm leaders say, is a beefing up of some present Ezra Taft Benson policies aimed at reducing surpluses — among them soil conservation to get acreage out of production, food disposal, and Food For Peace programs, and a commodity approach toward supply controls through marketing quotas set up by farmer referendums.

These programs are not expected to have any sizeable effect on pesticide or fertilizer sales in the immediate future. This is especially true since both industries are promoting production efficiency rather than mass production.

Growing "good neighborliness" with Latin American countries is bound to offer new opportunities to alert pesticide and fertilizer companies.

Back from a 15-day tour of five major Latin American coun-

(Continued on Page 71)



# Arcadian® News

Volume 5

For Manufacturers of Mixed Fertilizers

Number 12

## Where Are Your Best Fertilizer Markets?

**NEW 1959 CENSUS FIGURES NOW BEING RELEASED SHOW WHICH COUNTIES AND CROPS USE THE MOST FERTILIZER**

**New information** about the importance of each county in the United States as a fertilizer market is now being made available with the release of preliminary reports from the 1959 Census of Agriculture. These reports contain a wealth of data of vital interest to everyone who sells dry or liquid mixed fertilizers and fertilizer materials.

As we go to press, information has been published on counties in 34 states. Data on counties in additional states are now being compiled and will be released soon.

These preliminary reports reveal many findings on the use of commercial fertilizer:

- **Total farms in each county.**
- **Farms using fertilizer.**
- **Total acres fertilized.**
- **Total tons of fertilizer.**
- **Tons of dry materials used.**
- **Tons of liquid materials used.**

For each major crop classification for each county, the reports show the total acres fertilized and the amounts of dry and liquid materials used. Thus you have a graphic picture of the fertilizer market by counties and by crops. (*All figures on the use of fertilizer are based on information obtained from every fifth farm projected to cover all farms in the county.*)

To demonstrate to you the type of information that is contained in these preliminary reports, the Arcadian News has

prepared statewide tables for Illinois, Indiana and Ohio which appear on the two following pages. Similar data are available for each county in the three states, but space does not permit tables for all counties. We have also prepared a county map of the three states showing degree of intensity of commercial fertilizer consumption by counties.

It is interesting to note that corn is by far the largest user of commercial fertilizer in these three states, consuming 60% more than all other crops combined. Wheat is in second place with soybeans third.

From 1954 to 1959, there was a 19.6% reduction in total number of farms in the three states and a 12.7% reduction in number of farms using commercial fertilizer; but the number of acres fertilized increased 3.7%.

### Are You Interested?

After you have examined the map and the data on the following two pages, please let us know whether you would be interested in having a similar county map of the entire United States and fertilizer data on each county similar to the statewide data on Illinois, Indiana and Ohio.

If enough of our readers desire such data, Arcadian News will tackle the monumental task of tabulating and reproducing all of this information and placing it in your hands, without charge or obligation. Of course this cannot be done until preliminary census reports for all states have been released. Please let us know your wishes. Simply write to: ARCADIAN NEWS, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.



# 1959 Fertilizer Consumption

Based on U.S. Census of Agriculture Preliminary Figures Just Released

## ILLINOIS

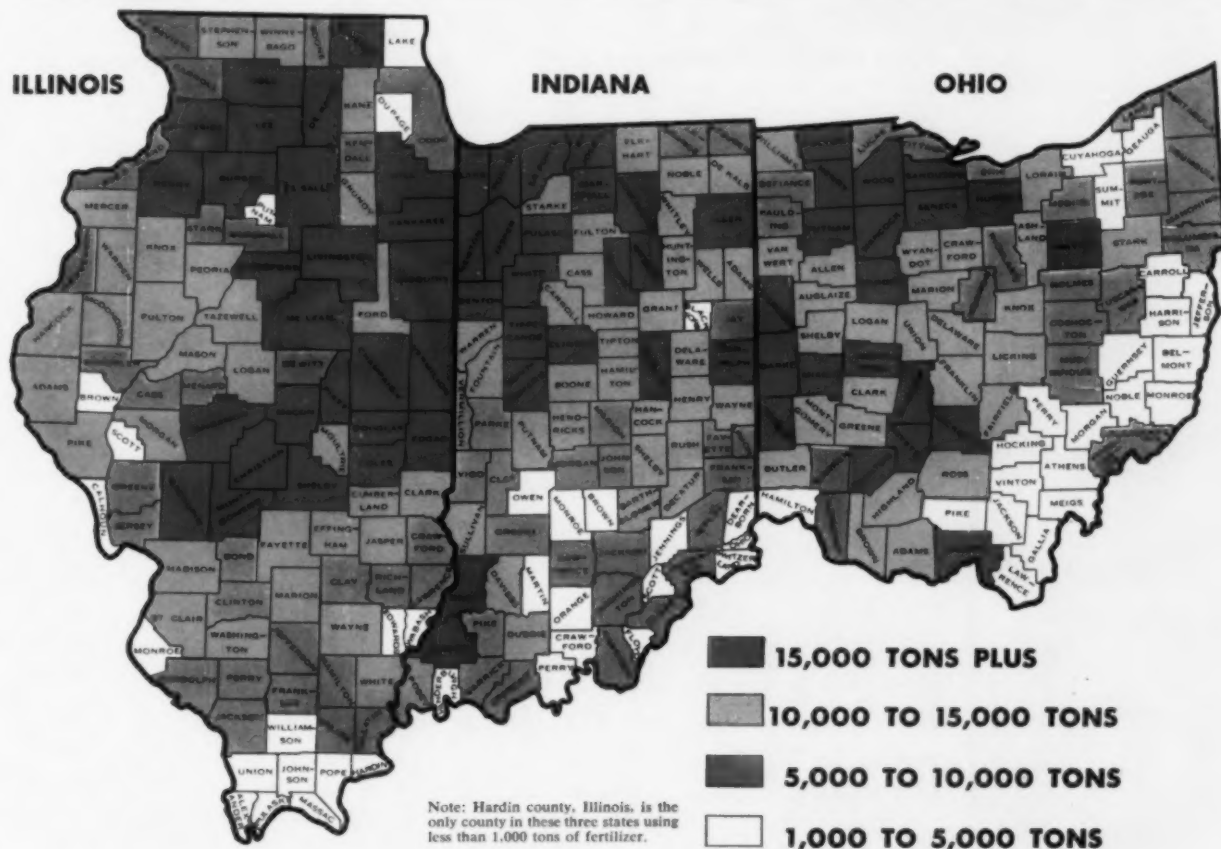
TOTAL FARMS IN STATE . . . . . 154,640  
FARMS USING FERTILIZER . . . . . 107,632  
TOTAL TONS OF FERTILIZER . . . 1,219,329

| CROP                                                                    | Acres Fertilized | Tons Dry Material | Tons Liquid Material |
|-------------------------------------------------------------------------|------------------|-------------------|----------------------|
| <b>CORN</b>                                                             | <b>6,483,003</b> | <b>677,542</b>    | <b>143,481</b>       |
| <b>WHEAT</b>                                                            | <b>1,255,233</b> | <b>147,045</b>    | <b>15,171</b>        |
| <b>SOYBEANS</b>                                                         | <b>489,998</b>   | <b>55,984</b>     | <b>1,754</b>         |
| <b>HAY &amp; CROPLAND PASTURE</b>                                       | <b>318,789</b>   | <b>76,013</b>     | <b>2,156</b>         |
| <b>All Other Crops</b><br><small>Including Non-Cropland Pasture</small> | <b>532,075</b>   | <b>97,262</b>     | <b>2,921</b>         |
| <b>TOTAL ALL CROPS</b>                                                  | <b>9,079,098</b> | <b>1,053,846</b>  | <b>165,483</b>       |

## INDIANA

TOTAL FARMS IN STATE . . . . . 128,160  
FARMS USING FERTILIZER . . . . . 102,416  
TOTAL TONS OF FERTILIZER . . . 1,005,600

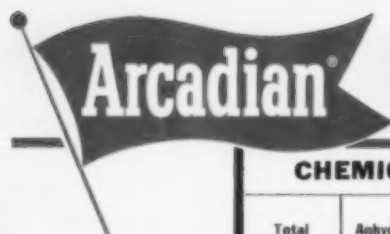
| CROP                                                                    | Acres Fertilized | Tons Dry Material | Tons Liquid Material |
|-------------------------------------------------------------------------|------------------|-------------------|----------------------|
| <b>CORN</b>                                                             | <b>4,839,631</b> | <b>581,559</b>    | <b>58,415</b>        |
| <b>WHEAT</b>                                                            | <b>1,163,838</b> | <b>140,987</b>    | <b>6,182</b>         |
| <b>SOYBEANS</b>                                                         | <b>823,685</b>   | <b>63,284</b>     | <b>1,437</b>         |
| <b>HAY &amp; CROPLAND PASTURE</b>                                       | <b>302,942</b>   | <b>40,451</b>     | <b>1,284</b>         |
| <b>All Other Crops</b><br><small>Including Non-Cropland Pasture</small> | <b>890,769</b>   | <b>108,103</b>    | <b>3,898</b>         |
| <b>TOTAL ALL CROPS</b>                                                  | <b>8,020,865</b> | <b>934,384</b>    | <b>71,216</b>        |



# OHIO

**TOTAL FARMS IN STATE . . . . . 140,353**  
**FARMS USING FERTILIZER . . . . . 111,441**  
**TOTAL TONS OF FERTILIZER . . . . . 933,759**

| CROP                                                     | Acres Fertilized | Tons Dry Material | Tons Liquid Material |
|----------------------------------------------------------|------------------|-------------------|----------------------|
| <b>CORN</b>                                              | <b>3,423,979</b> | <b>489,658</b>    | <b>22,800</b>        |
| <b>WHEAT</b>                                             | <b>1,273,750</b> | <b>176,246</b>    | <b>4,880</b>         |
| <b>SOYBEANS</b>                                          | <b>296,657</b>   | <b>26,342</b>     | <b>586</b>           |
| <b>HAY &amp; CROPLAND PASTURE</b>                        | <b>279,306</b>   | <b>42,375</b>     | <b>521</b>           |
| <b>All Other Crops</b><br>Including Non-Cropland Pasture | <b>1,118,438</b> | <b>166,862</b>    | <b>3,489</b>         |
| <b>TOTAL ALL CROPS</b>                                   | <b>6,392,130</b> | <b>901,483</b>    | <b>32,276</b>        |



# NITROGEN SOLUTIONS

|                                                        | CHEMICAL COMPOSITION % |                   |                  |      |       |      | PHYSICAL PROPERTIES                             |                            |                                                 |
|--------------------------------------------------------|------------------------|-------------------|------------------|------|-------|------|-------------------------------------------------|----------------------------|-------------------------------------------------|
|                                                        | Total Nitrogen         | Anhydrous Ammonia | Ammonium Nitrate | Urea | Water |      | Neutralizing Ammonia Per Unit of Total N (lbs.) | Approx. Sp. Grav. at 60° F | Approx. Vap. Press. at 104° F per Sq. In. Gauge |
| NITRANA®                                               |                        |                   |                  |      |       |      |                                                 |                            |                                                 |
| 2                                                      | 41.0                   | 22.2              | 65.0             | —    | 12.8  | 10.8 | 1.137                                           | 10                         | 21                                              |
| 2M                                                     | 44.0                   | 23.8              | 69.8             | —    | 6.4   | 10.8 | 1.147                                           | 18                         | 15                                              |
| 3                                                      | 41.0                   | 26.3              | 55.5             | —    | 18.2  | 12.8 | 1.079                                           | 17                         | -25                                             |
| 3M                                                     | 44.0                   | 28.0              | 60.0             | —    | 12.0  | 12.7 | 1.083                                           | 25                         | -36                                             |
| 3MC                                                    | 47.0                   | 29.7              | 64.5             | —    | 5.8   | 12.6 | 1.089                                           | 34                         | -30                                             |
| 4                                                      | 37.0                   | 16.6              | 66.8             | —    | 16.6  | 8.9  | 1.184                                           | 1                          | 56                                              |
| 4M                                                     | 41.0                   | 19.0              | 72.5             | —    | 8.5   | 9.2  | 1.194                                           | 7                          | 61                                              |
| 6                                                      | 49.0                   | 34.0              | 60.0             | —    | 6.0   | 13.9 | 1.050                                           | 48                         | -52                                             |
| 7                                                      | 45.0                   | 25.3              | 69.2             | —    | 5.5   | 11.2 | 1.134                                           | 22                         | 1                                               |
| URANA®                                                 |                        |                   |                  |      |       |      |                                                 |                            |                                                 |
| 6C                                                     | 43.0                   | 20.0              | 68.0             | 6.0  | 6.0   | 9.3  | 1.180                                           | 12                         | 39                                              |
| 6M                                                     | 44.0                   | 22.0              | 66.0             | 6.0  | 6.0   | 10.0 | 1.158                                           | 17                         | 14                                              |
| 10                                                     | 44.4                   | 24.5              | 56.0             | 10.0 | 9.5   | 11.0 | 1.114                                           | 22                         | -15                                             |
| 11                                                     | 41.0                   | 19.0              | 58.0             | 11.0 | 12.0  | 9.2  | 1.162                                           | 10                         | 7                                               |
| 12                                                     | 44.4                   | 26.0              | 50.0             | 12.0 | 12.0  | 11.7 | 1.087                                           | 25                         | -7                                              |
| 13                                                     | 49.0                   | 33.0              | 45.1             | 13.0 | 8.9   | 13.5 | 1.033                                           | 51                         | -17                                             |
| DURANA®                                                |                        |                   |                  |      |       |      |                                                 |                            |                                                 |
| DURANA is a trade-mark of Allied Chemical Corporation. | 37.0                   | 13.3              | 53.4             | 15.9 | 9.4   | 7.2  | 1.235                                           | 0                          | 36                                              |
| U-A-S®                                                 |                        |                   |                  |      |       |      |                                                 |                            |                                                 |
| A                                                      | 45.4                   | 36.8              | —                | 32.5 | 30.7  | 16.2 | 0.932                                           | 57                         | 16                                              |
| B                                                      | 45.3                   | 30.6              | —                | 43.1 | 26.3  | 13.5 | 0.978                                           | 48                         | 46                                              |
| Anhydrous Ammonia                                      | 82.2                   | 99.9              | —                | —    | —     | 24.3 | 0.618                                           | 211                        | -108                                            |

\*DURANA contains 8% formaldehyde.

**Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia**

**When you** purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen prod-

ucts on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

## NITROGEN DIVISION

MAIN OFFICE: 40 RECTOR ST., NEW YORK 6, N. Y., PHONE HANOVER 2-7300



Hopewell, Va., P. O. Drawer 131 ..... Glenview 8-6301  
 Ironton, Ohio, P. O. Box 98 ..... Drexel 7-4366  
 Omaha 7, Neb., P. O. Box 166 ..... 29 1-1464

Raleigh, N. C., 606 Capital Club Bldg. .... Temple 3-2801  
 Columbia 1, S. C., 1203 Gervais St. .... Alpine 3-6676  
 Atlanta 3, Ga., 127 Peachtree St., N. E. .... Jackson 2-7805

Memphis 9, Tenn., 1929-B South 3rd St. .... Whitehall 8-2692  
 Indianapolis 20, Ind., 6060 College Ave. .... Clifford 5-5443  
 San Francisco 4, Cal., 235 Montgomery St. .... Yukon 2-6840

tries, Agriculture Secretary Ezra Taft Benson re-affirmed Latin Americans' desire to greatly expand their agriculture.

This will be a two-way street, with the U. S. importing more non-competitive farm products, such as sugar and coffee, from Latin America, and exporting more wheat and grains.

What it means to agricultural chemicals, however, is rapidly growing markets for pesticides and fertilizers in Latin America. As one example, USDA wants all Chilean fruits imported into the U. S. fumigated to eradicate pests before the fruits leave Chile, and is willing to send U.S. experts to Chile to help with the job.

Also, the U. S. is likely to be spending more aid money in Latin America over the next few years than ever before. Some will go toward building up agriculture. Coupled with the multi-million dollar program of the UN's Food and Agriculture Organization to promote know-how of using pesticides and fertilizers, among other things, around the world, the new U. S. concern over Latin American economies and living standards is bound to boost demand for agricultural chemical products.

USDA, we might add, has been stepping up conferences on how to improve its agricultural services to foreign areas, and has been encouraging foreign agricultural leaders to visit the U. S., become familiar with U. S. agriculture and with U.S. firms serving agriculture.

As we have predicted for many months in this column, the U. S. firms that get themselves well established with Latin American agricultural leaders will be in a top position to increase their sales even in the face of growing competition from British, French, and West German firms.

\* \* \* \*

The Pesticides Industry has chalked up another gain of 3 to 5 percent in sales during 1960, bringing total product sales to about \$290 million at the manu-

facturer's level. Sales of plant foods also have gone up during the year just closing.

What leaders in both industries here indicate is that a strong trend toward more and better merchandising of their products is the key toward boosting sales even more during 1961.

You can expect to see more merchandising efforts during coming months, particularly on the part of the National Agricultural Chemicals Association. The emphasis will be on improving farmers' know-how in using pesticides to boost production efficiency and in motivating them to make pesticides a regular part of their farm management plans.

\* \* \* \*

Pesticide manufacturers, incidentally, are far from out of the woods in their running conflicts with wildlife enthusiasts. A case in point is the National Conference on Water Pollution here in Washington this month.

The major objective of the Conference is to seek "reasonable pollution abatement controls" aimed mainly at sewage treatment. Several wildlife groups, however, have been urging their members to "speak up from the floor" at the Conference and afterwards. What they are seeking is a policy of keeping rivers and streams as free of pollution as possible rather than the current policy of permitting as much pollution as the waters can safely absorb.

From a number of sources inside the government as well as inside wildlife groups, we have learned that a number of spokesmen have been loading up with figures on fish and wildlife kills allegedly caused by the run-off of pesticides. A feature of the Conference will be a talk by Dr. Clarence Cottam of the Welder Wildlife Foundation, on "Chemical Pollution."

\* \* \* \*

We can expect to hear a lot more from the newly-formed Sulphur Institute in the very near future. Delbert L. Rucker, for years the director of publications

and visual services for the National Plant Food Institute, has been named Director of Information for the Sulphur Institute.

The main emphasis of the Institute is on research and the dissemination of technical information. Since agriculture is a major market for sulphur, much of this information will be of direct interest both to pesticide and fertilizer manufacturers.

\* \* \* \*

You can watch, too, for more activity on the part of the National Aviation Trades Association in informing the public on the benefits of and safety of aerial application. NATA is unveiling the start of a new information program at its annual meeting in Oklahoma City this month aimed to benefit all aviation trades.★★

•

#### **CACA Meeting in Denver**

The Colorado Agricultural Chemicals Association will hold its annual business meeting and banquet January 26 and 27 at the Cosmopolitan Hotel in Denver, Colorado.

•

#### **Niagara Names Western Reps.**

New appointments in Niagara Chemical's western agricultural department were reported last month by G. F. McLeod, the Department's Manager of technical service to sales. Keith Rathbone and W. H. Wade were named to regional technical service managerial posts, while Donald H. Little and James Skelsey were made regional technical service representatives.

Keith Rathbone will serve as manager of technical service to sales for the San Joaquin Valley (California) region, with headquarters in Fresno.

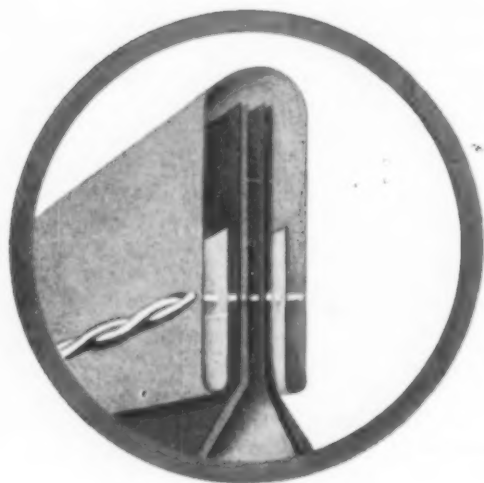
William Wade has been assigned as manager of technical service to sales for a region including Northern and West Central California, Nevada, and Utah. D. H. Little will serve the San Joaquin Valley; and J. J. Skelsey will represent Niagara technical service to sales in Oregon, Montana, Idaho, Washington, and Wyoming.



ANOTHER TECHNICAL ADVANCE FROM WEST VIRGINIA

# NEW **ImpactTAPE**<sup>TM</sup>

## DRASTICALLY REDUCES SEWN-END BAG FAILURE



Pioneer in the development of Clupak\* extensible paper, West Virginia now leads the way to a far stronger, tighter, money-saving sewn multiwall through "ImpactTape."

ImpactTape is a revolutionary new type of sewn tape closure\*\* that adds four layers of tape to the sewn end instead of the conventional two. This provides 49% greater toughness than standard sewn 70-lb. tape closures plus a new "cushioning" against impact shock.

### PROOF from actual field trial

A leading cement company had an unusually high sewn valve breakage rate of 1%. They packed a trial shipment of bags, using West Virginia's new ImpactTape. Average breakage rate went down to .3%—a reduction of 70%. Dollar savings from reduced breakage will far exceed the small upcharge for the new closure.

### PROOF from new testing technique

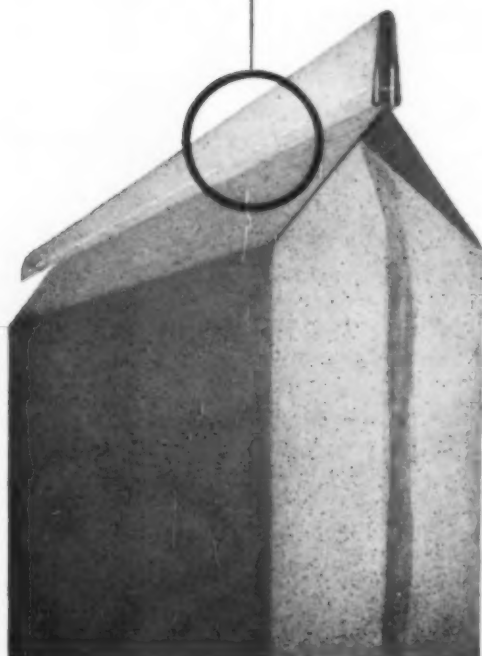
The development of ImpactTape was hastened by West Virginia's successful adoption of the Impact Resistance Tester to measure sewn end toughness under conditions of sudden shock. It represents the only sewn closure test devised thus far which bears a predictable correlation to drop tests and actual field performance.

Studies indicate that 70% of sewn bag breakage ordinarily is at the sewn closure, even on Clupak paper bags, because the sewn closure is the weakest point in the bag. Often this breakage was incorrectly blamed on the paper. Now stronger ImpactTape opens the door to profits from the greater toughness and possible basis weight reductions which Clupak paper is delivering to thousands of users. *This is realistic research achievement—aimed straight at reducing your total packaging costs.*

For a brochure giving detailed information, write and tell us whether you use sewn open mouth or sewn valve bags. Multi-wall Bag Division, West Virginia Pulp and Paper Company, 230 Park Ave., New York 17, N. Y.

\*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications.

\*\*Patent Pending.



**West Virginia  
Pulp and Paper**



## Carbide Mgr., Specialty Chems.

John R. Hulten has been named manager—Specialty Chemicals Marketing for Union Carbide Chemicals Co., —Div. Union Carbide Corp., New York. Mr. Hulten is responsible for marketing UCON brand fluorocarbons to the aerosol, agricultural chemicals and refrigeration industries.



John R. Hulten

## Fewer Farms, More Pesticides

Leading farm economists meeting in Washington last month predicted fewer farms but increased use of pesticides, feeds, etc. over the next five year period. Greater specialization and further advances in technology are cited as basis for the anticipated increase.

A report by the Agricultural Research Service predicts a rise for these products of as much as 20% from 1959 to the mid-sixties. Lesser rises of 10 to 15 percent are in prospect for chemical fertilizers, machinery, etc.

## Morton Appoints Two

Larry Gallagher has been appointed sales representative and Charles M. Gates was named technical sales representative for soil pesticides by the Morton Chemical Co., Chicago.

Mr. Gates will cover six mid-western states and Canada from headquarters in Chicago. Mr. Gallagher will travel in Montana, western North Dakota, and northern Wyoming.

## Armour To Expand Chemicals

Armour and Co., Chicago, is planning a \$60,000,000 expansion program that, for the first time in history, will make its meat busi-

ness investment secondary to its chemical. The expansion will be made in the Armour Agricultural Chemical Co. and will approximately triple current production of phosphates and nitrogen by 1962.

A nitrogen plant will be built at Sheffield, Ala., and a phosphate operation in Polk County, Florida.

## IMC Advances Archer

International Minerals & Chemical Corp., Skokie, Ill., has named James R. Archer to be quality control manager of the Plant Food Division. He had been chief chemist of the division and has been with IMC since 1934.

## Advanced By Davison

John T. Sadler, Jr., has been named director of purchases of the mixed fertilizer division of the Davison Chemical Division of W. R. Grace & Co., Baltimore, Md.

Mr. Sadler has been assistant director of purchases for the past three years and moved into the present position with the retirement of Edward A. McGinity.

## CCA To Build In Nebraska

An anhydrous ammonia fertilizer plant to serve cooperatives in Nebraska and adjoining states will be built by Consumers Cooperative Association in the Hastings, Neb., area. The plant will provide a second source for cooperatives that get anhydrous ammonia through CCA. Since 1954, cooperatives in the Nebraska area have been users of nitrogen products of the cooperatively-owned plant at Lawrence, Kansas. CCA owns 75 per cent of the Lawrence plant.

## Allied Names Sales Managers

Allied Chemical's Nitrogen Division has announced several promotions resulting from a recent decision to establish 4 major agricultural sales regions.



Elmer Perrine

Elmer Perrine has been named director of technical service, agricultural products. He was technical service representative.

Garvin C. Matthiesen has been appointed agricultural sales manager. Thomas C. Roger has been named product manager, fertilizer manufacturing; and George A. Kalteissen has been advanced to product manager, direct application sales.

## Hurst Joins Globe Labs.

Dr. Harold L. Hurst has been named director of research at Globe Laboratories, Fort Worth, Texas. He had been with Hazleton Research Laboratories, Falls Church, Va.

## Baker Named Distributor

Brockville Chemicals Ltd., Montreal, has appointed H. J. Baker & Bro. (Canada) Ltd., Montreal, as distributor for anhydrous ammonia, ammonium nitrate, and nitrogen solutions to the Canadian fertilizer industry, and H. J. Baker & Bro., New York, will distribute the same products in the United States. The products will come from a nitrogen chemicals plant now under construction near Maitland, Ontario.

## Retzlaff Transfers Lamb

Retzlaff Chemical Company announces the transfer of Mr. Latane Lamb from their Houston office to a similar position in Atlanta, Georgia. New facilities for warehousing and laboratory evaluations for agricultural chemical emulsifiers will be opened here.

### Prather Joins Star

Star Enterprises, Inc., Cassopolis, Michigan, has appointed Thomas Prather



at the home office as head of purchasing, warehousing, and traffic. Mr. Prather had been manager of the wholesale division of the Ridge Automotive Supply Co., South Bend, Ind.

He is located in Cassopolis. Star Enterprises manufactures Creek-O-Nite clay.

### N. J. Plant Food Meeting

At its Nov. 30th meeting, at Rutgers University, the N. J. Plant Food Educational Society discussed a number of topics relating to plant foods. L. Karp, Morris Karp & Sons, fertilizer manufacturers, Farmingdale, N. Y., discussed the topic, "how the urbanization of Nassau County has affected the fertilizer industry." College of Agriculture staff members reported on their research.

### Bemis Plant Manager

Gordon M. Robb, formerly manager of the Bemis Bro. Bag Co. plant and sales division in Houston, Texas, has been transferred to the company's Peoria, Ill., plant and paper mill. He succeeds L. J. Finn, who will retire on Jan. 31, 1961, as plant manager.

### Wisconsin Pesticide Conference

The 15th annual Wisconsin Pesticide Conference with Industry (formerly the Insect Control Conference with Industry) will be held Jan. 5 and 6 at the Memorial Union, University of Wisconsin, Madison.

### To Feature New Herbicides

For the third year, "New Herbicides from Industry" will be a special feature of the Northeastern Weed Control Conference to be held in New York on January 4th, 5th and 6th.

Industry representatives have been invited to participate by presenting data on:

- New herbicides that will be available for experimental testing in the 1961 season.

- New herbicides now commercially available or to be marketed for the coming season.

- Improvements made on older herbicides or extended new uses for them.

This portion of the conference will begin at 8 P.M. on January 4th in the Grand Ballroom of the Hotel New Yorker.

Five minutes will be allotted to each product. The "New Herbicides" program is headed by Charles L. Hovey, Eastern States Farmers' Exchange, West Springfield, Mass., past president of the conference.

### Extent Tedium Tolerance

Niagara Chemical Division of Food Machinery and Chemical Corp., Middleport, N. Y., has announced that the Food and Drug Administration has approved a tolerance of 2 ppm residues of Thiodan insecticide on strawberries. Previously Thiodan could be used on strawberries only at the pre-bloom and post-harvest stages. The product now can be used for mite control up to eight days before harvest.

### Monsanto Fills New Post

Charles L. Fetzner, former western district sales manager, has been appointed to fill the newly-created position of senior sales representative for the western United States by the Agricultural Chemicals Division of Monsanto Chemical Co., St. Louis.

### To Work Phosphate Deposits

The Venezuelan government plans to develop large deposits of natural phosphate fertilizer in the Lobatera region of Tachira State. Tests of the phosphates, made under the direction of Dr. Gaylord M. Volk of the University of Florida Agricultural Experiment Station, Gainesville, Fla., indicate that the Lobatera phosphates are especially suited for acid soils, due to their high calcium carbonate content. Authorities plan to build a plant.

### Pasture Repellent Offered

Henry Town Laboratories, Madison, Wisc., is offering Pestrin In-Pasture Repellent, a new product that is said to repel flies, face flies, mosquitoes, and gnats from livestock in the pasture for two to five days per application. The company is constructing a plant in Madison to produce the repellent, which is expected to be available for the 1961 season.

### DDT Enzyme Studies

At a meeting of the Headlee Fellowship Advisory Council, held on October 27th, A. S. Tombes reported on his studies of DDT-dehydrochlorinase, which enables certain insects to convert the insecticide DDT into a harmless substance. This enzyme which occurs naturally in Mexican bean beetle is probably responsible for the natural tolerance of this insect to DDT, said Dr. Tombes.

W. C. Nettles, Jr., also a Headlee fellow, reported on his studies of toxins in the blood of insects. He expressed the hope that identification of certain toxins might lead to the development of more effective insecticides.

### Heads Chemtree Corp.

William C. Hall has become president and a director of Chemtree Corp., Harriman, N. Y. He had been president of Arboreal Associates, Inc., a company which has been purchased by Chemtree.

### WARF Pesticide Department

The Wisconsin Alumni Research Foundation, Madison, Wisc., has formed a Pesticide Department that includes the former Insecticide Testing Laboratory and expanded facilities for testing and screening compounds for activity as herbicides, fungicides, nematocides, bactericides, algacides, and others. A 10,000 square-foot building has been remodeled and will house the entire department.

Acting head of the department is G. E. Schmolesky. He is assisted by C. D. Kuzdas.

### Rucker Joins Sulphur Group

Delbert L. Rucker has been appointed director of information for the Sulphur



Institute, Washington, D. C. He had been serving as director of publications and visual services for the National Plant Food Institute.

Mr. Rucker joined the former Oriental Consolidated Mining Co. in Hokuchin, Korea as an engineer in 1938. Following service in the U. S. Navy during World War II, he spent 12 years with the U. S. Department of Agriculture in various informational and administrative posts. From 1953 to 1955, he was director of information for the former National Fertilizer Association, a predecessor of the National Plant Food Institute.

### Heads Boll Weevil Lab.

Dr. Theodore B. Davich has been appointed director of the new Boll Weevil Research Laboratory at State College, Miss. The laboratory is expected to be completed in July, 1961. Research will be conducted in cooperation with the Mississippi State Agricultural Experiment Station and the state university, as well as other experiment stations in the weevil area.

### To Expand Wellsburg Plant

West Virginia Pulp and Paper Co., New York, is investing \$700,000 in improvements at its Wellsburg, W. Va., multiwall plant. A new highspeed, stepped-end tuber, bottomer, press, and bag machine at Wellsburg are expected to increase production of pasted valve multiwalls from 3 to 6 million bags per month.

### Kolb Retires From APCC Post

Edward M. Kolb, assistant to the vice-president of marketing and director of potash sales for American Potash & Chemical Corporation, retired October 1, after 28 years of service with the company. Mr. Kolb, who made his headquarters at AP&CC's New York sales office, had been with the company since 1932.

At the time of his retirement he was a member of the boards of directors of the American Potash Institute and the Potash Export Association.

He will continue to serve the American Potash & Chemical Corporation as a consultant to W. J. F. Francis, vice-president, marketing, and Dr. A. J. Dirksen, general sales manager, eastern.

### Heyden Names Gluck

Michael J. Gluck has been appointed vice-president and general manager of Heyden Newport International Division, Heyden Newport Chemical Corp., New York.

### Dyer Joins Bradley & Baker

H. Clair Dyer has joined Bradley & Baker's St. Louis office as a fertilizer sales representative. He will contact fertilizer manufacturers in Illinois.

### Agronomy Society Meeting

The American Society of Agronomy will hold its 1960 annual meeting in the Morrison and Hamilton hotels, Chicago, Ill., Dec. 5 to 8. The meeting will be held in conjunction with the Soil Science Society of America, the Crop Science Society of America, and the Agronomic Education Division.

### Ortho Building In Iowa

Ortho Division, California Chemical Co., Richmond, Calif., has begun construction of its \$22,000,000 fertilizer plant on a 425-acre site on the Mississippi River near Fort Madison, Iowa.

When completed, the plant will be one of the largest fertilizer production centers in the world and is said to represent the largest investment ever made in any fertilizer facility anywhere.

### Sohio Appoints Two

John C. Frederick has been appointed technical service representative and Cecil E. Baylor has been appointed an agronomist by Sohio Chemical Co., Lima, Ohio.

Mr. Frederick had been assistant superintendent of the Joplin, Mo., plant of the Davison Chemical Co. Mr. Baylor formerly served in various capacities with Aylco Chemical Co. and the Smith-Douglass Co.

### C-VPFA Meeting December 5-7

The Carolinas-Virginia Pesticide Formulators are meeting Dec. 5-7 at the Carolina Hotel, Pinehurst, N. C.

The program for the meeting includes a discussion by E. L. Chandler, Diamond Alkali Co., on the "Basic Manufacturer's Viewpoint Regarding the Problem of Excessive Residues on Agricultural Commodities"; W. L. Popham, USDA, discussing "Responsibility for Use of Chemicals in Agriculture"; J. W. Sanders, FDA, reporting on "Establishing and Enforcing Pesticide Tolerances"; and "A Sound Marketing Program for Agricultural Chemicals" by G. L. Dennis, Naugatuck Chemical Co.

### Seeks U. S. Agents

The Composting Co. of Rhodesia, Pvt., Ltd., P. O. Box 1327, Salisbury, Southern Rhodesia, has announced that it wishes to appoint agents in the United States to sell its system of composting municipal refuse with sewage sludge.

### Shell To Build Plant

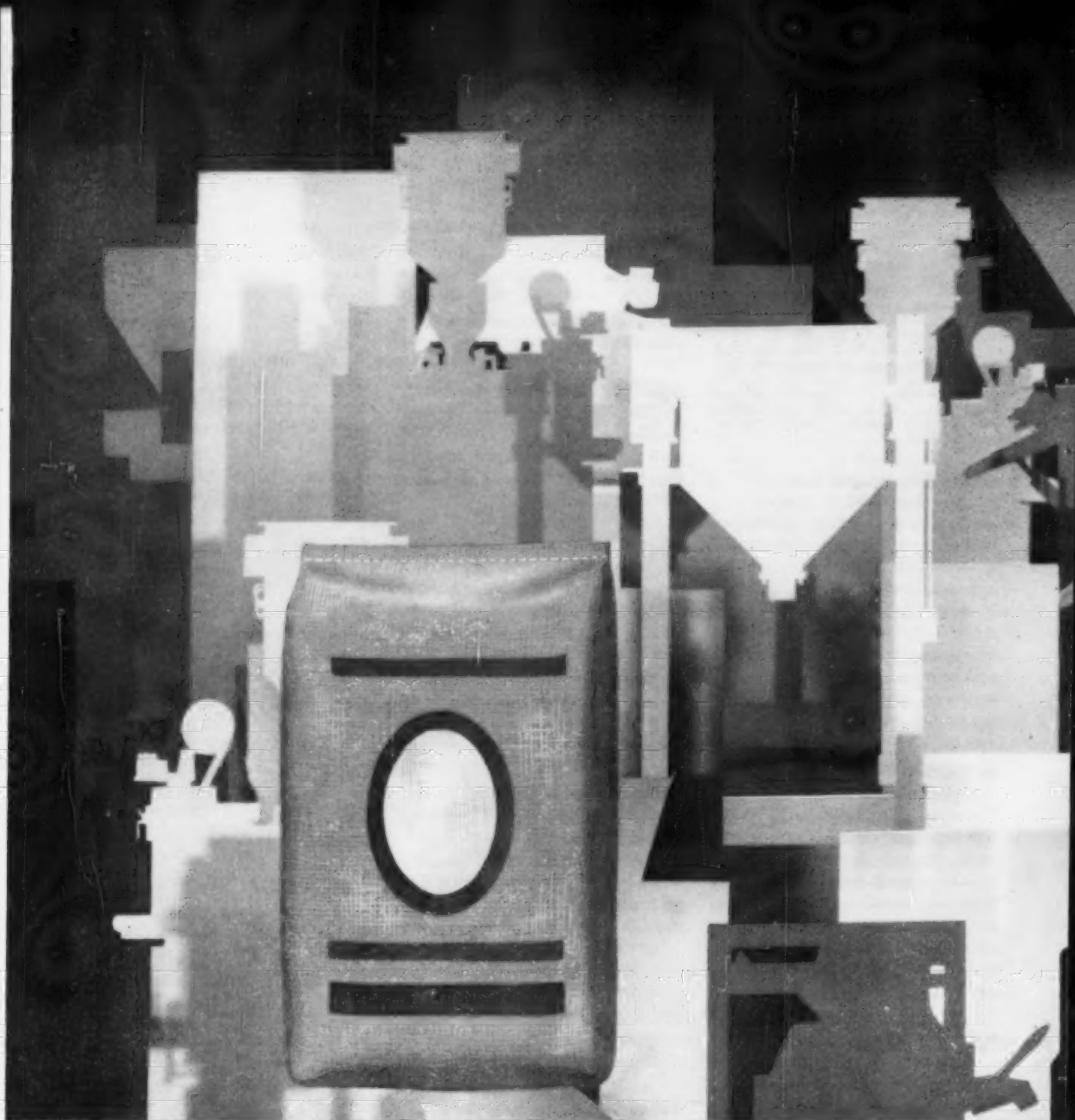
Shell Oil Co. has announced plans to build a \$20,000,000 gas processing and sulfur manufacturing plant in Pinched Creek district, southern Alberta, Canada.

### Council Honors Paul T. Truitt

Marshall Peterson, safety engineer of the National Safety Council, presents framed "Letter of Commendation" to Paul T. Truitt, (right), president of the National Plant Food Institute, in token of Mr. Truitt's contributions to accident prevention in the fertilizer industry. The presentation to Mr. Truitt was made at the annual Safety Congress Oct. 17, at a meeting of the Council's Fertilizer Section.







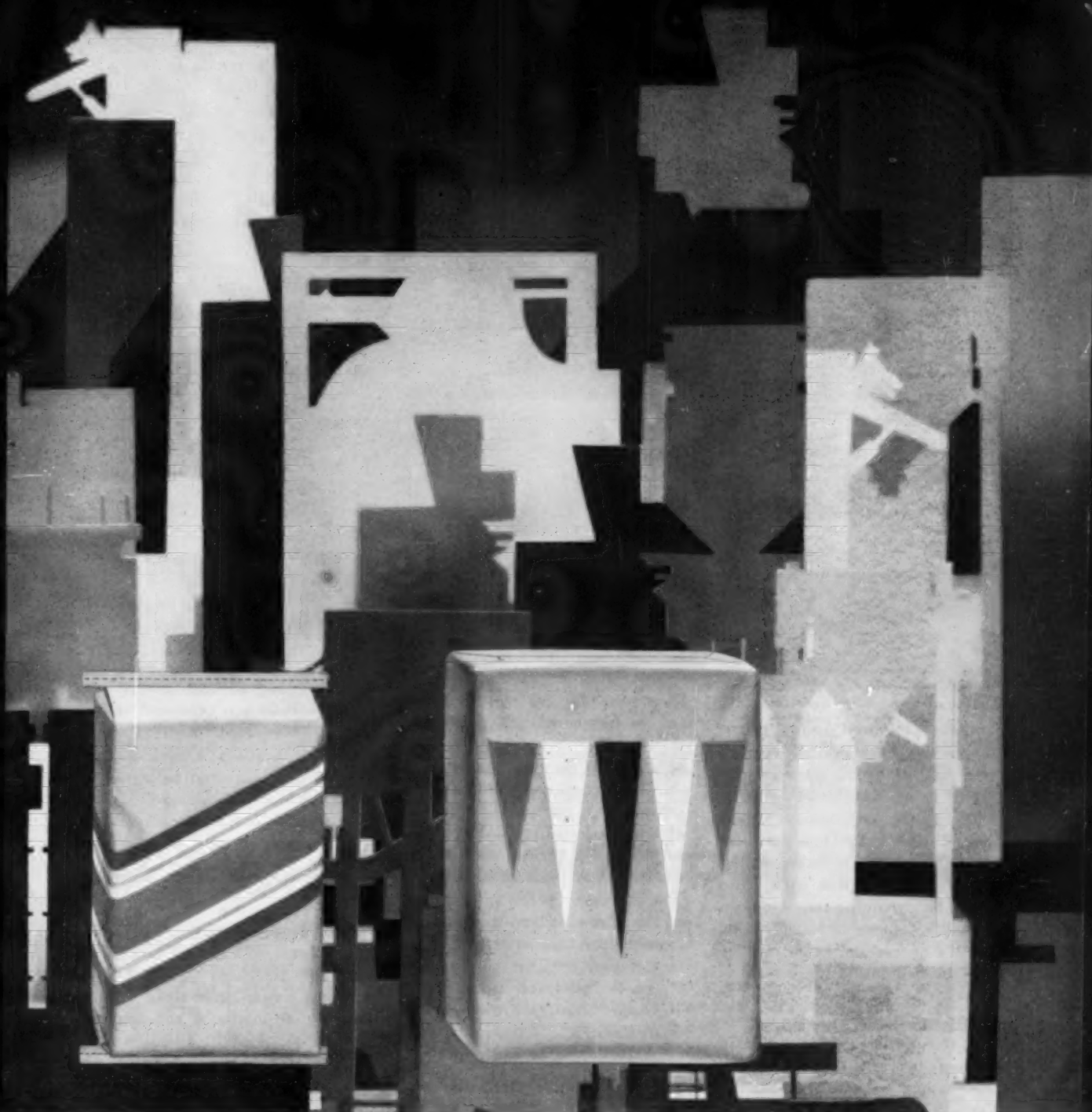
## Profit-building packaging

Want the machine that will do the best and most economical job of packing your product? Only St. Regis® offers you a line of bag packing machinery over 50 models deep. That means you choose from the widest selection in the industry...you get the machine best suited to the job...a machine that does the work faster, more accurately and at the lowest cost.

A full line of machinery is only part of the most com-

plete bag service ever offered—*Packaging-in-Depth*. This service gives you the benefits of a *complete* line of bags—multiwall, textile and WPPL. It includes St. Regis research that works for you, pioneering advances like the Force Flow,<sup>®</sup> Streamflow and Easiflow Packers and developing special protective papers such as Capcote PE for greater moisture protection at lower cost.

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throughout the country, count on St. Regis for swifter delivery of the bags you want when and where you want them. All this is backed by the most complete staff of packaging engineers, field engineers and materials han-

dling specialists in the industry.

It all adds up to this: behind each St. Regis machine or bag you buy stands the most complete bag service available. This is St. Regis *Packaging-in-Depth!*

**PACKAGING-IN-DEPTH BY St. Regis**  **BAG DIVISION**  
PAPER COMPANY

## Attendance Exceeds 46,000 At National Hardware Show

Final registration audits indicate that a total of 46,272 persons attended the 15th annual National Hardware Show, Oct. 10 to 14 at the Coliseum in New York. That is an increase of 945 over last year's record high of 45,327, according to Frank M. Yeager, managing director of the show.

More than 1,000 manufacturers exhibited. Two floors and a mezzanine were devoted to hardware, housewares, and allied items, while the third and fourth floors featured what was described as the largest array of lawn, garden, and out-



door living products ever assembled. A portion of the show's visitors are shown above. The 1961 show is scheduled to be held Oct. 2 to 6 in Chicago's Exposition Center.

### Thuricide Shows Promise

Stauffer Chemical Co., New York, has announced that Thuricide, the microbial insecticide, has shown promising results in the control of forest insects. Three large-scale forest insect tests were run this year.

One hundred and twenty pounds of Thuricide concentrate were applied by air on deciduous forests near Middlebury, Vt., to control gypsy moth larvae. Rates were 2 and 4 lbs. per acre and preliminary results indicate high mortality of the pest with either rate. The remaining tests were conducted in Canada in efforts to control the spruce budworm and the black-headed budworm.

### To Distribute In Hawaii

The Ortho Division of California Chemical Co., Richmond, Calif., has appointed American Factors Ltd. as distributors of the Ortho line of agricultural and garden pesticides and fertilizers in Hawaii.

### Bemis Plant Expansion

Bemis Bro. Bag Co., St. Louis, is planning to undertake a plant expansion and modernization program. Features of the program include a new plant near Muskegon, Mich., for the manufacture of

Tekmold, and plant expansions in St. Louis, Mo., Claremont, N. H., Flemington, N. J., and Vancouver, Wash. About half of the total expenditures will be devoted to new papermaking and bag converting equipment installations in these locations. The total cost is expected to be more than \$1,200,000.

### N. C. Fertilizer Use Down

A drop of more than six per cent in manufacturer's shipments of mixed fertilizer and fertilizer materials to each county in North Carolina was reported last month. The decrease was felt in all but 17 of the state's 100 counties, ranging from 25 per cent in Dare County, where total fertilizer consumption is small, to three per cent in Robeson County, largest user of fertilizer in the state.

### Named To New Division

An advertising and promotion manager and a marketing services manager have been appointed for Monsanto Chemical Co.'s recently-formed Agricultural Chemicals Division.

Eugene D. Smith, formerly advertising manager for the Lion Oil Co. division of Monsanto, is responsible for advertising and product promotion programs for the new division. Robert E. Ude is

responsible for the marketing services function. He formerly managed sales office operations for the company's marketing services department.

### Heads Parasite Laboratories

Dr. Aurel O. Foster has been appointed director of the U. S. Department of Agriculture's parasitological research laboratories at Beltsville, Md. Since 1941, Dr. Foster has been in charge of ARS research on means of controlling animal parasites.

### National Cotton Council

The 1961 meeting of the National Cotton Council will be held at the Peabody Hotel, Memphis, Tenn., from January 30-31.

### SunOlin Urea To Korea

In what was called the largest dry cargo shipment from a Delaware Valley plant ever to leave the Port of Philadelphia (Pa), six million pounds of urea fertilizer were shipped to Korea, Oct. 22. The fertilizer was produced at the recently-completed plant of SunOlin Chemical Co., Claymont, Del. The ship is expected to arrive in Pusan, Korea on Dec. 12.

SunOlin is the only major urea producer on the east coast of the U. S. Its plant has a capacity of 73,000 tons per year of urea.

### Sales Regions Realigned

Chemagro Corp., Kansas City, Mo., has increased the number of its sales regions from three to four with the formation of the southern region. Stanford L. Adams is sales manager of the new region.

Headquarters for the eastern region have been moved from Richmond, Va., to Haddonfield, N. J. William H. Bricker is manager of the eastern region.

### Ill. Spray School Jan. 25

The 13th annual session of the Illinois Spray Operators School will be held January 25 and 26 in the Illini Building on the campus of the University of Illinois at Urbana, Ill.



*Always before, this material had to be blasted. Then they bought a Michigan Tractor Shovel. It ended the trouble and*

## **SAVED \$34,000 per year**

Ability of their Michigan Tractor Shovel to dig a material which always before had to be blasted is saving an estimated \$34,000 per year for Davison Chemical Co, Bartow, Florida.

Together with its digging power, the Michigan also has proved mobile enough to work quickly in the same tight quarters as the smaller loaders it replaced.

The material being handled is triple super-phosphate—manufactured, stored and cured at this plant for at least four weeks. The Michigan is a Model 85A, 9000 lb lift capacity equipped with  $1\frac{3}{4}$  yd bucket and replaceable bucket teeth. Its savings have been fourfold...

**ONE**, because the 96 hp Michigan can effectively load the hard-set TSP, Davison has eliminated all blasting.

**TWO**, the plant has traded in one

of the two  $\frac{3}{4}$  yd tractor shovels previously used to handle the blasted material, moved the second to another job. This transfer has resulted in substantial savings due to the Michigan's lower maintenance cost and greater capacity.

**THREE**, no less than 12 men (on a 3-shift basis) have been transferred to other jobs... 3 tractor shovel operators, 6 drillers, 3 dynamite handlers.

**FOUR**, with the elimination of blasting has come the elimination also of building repairs. No more are holes blown in the sides and top of the 25,000 ton capacity curing and storage shed.

**40 to 45 loads moved hourly**

Photo above shows typical operation. Like most loads, this one totals about  $1\frac{3}{4}$  cu yds, 1800 to 2000 lbs.

In seconds, the Michigan will turn, drive 25 to 150 ft, and feed the crusher hopper. Output, loaded by hopper conveyor into railcars, averages 40 to 45 Michigan bucket loads, 36 to 45 tons per hour.

### **Try Michigan on your job**

Michigans, of course, can't *always* eliminate blasting. But they do have almost unbelievable breakout force (plus maneuverability, plus unexcelled dependability). We'll be glad to give you the proof of a demonstration. Seven 4-wheel-drive, two 2-wheel-drive models to choose from.

Michigan is a registered trademark of  
**CLARK EQUIPMENT COMPANY**  
Construction Machinery Division

**CLARK  
EQUIPMENT**

2463 Pipestone Road  
Benton Harbor 26, Michigan  
In Canada:  
Canadian Clark, Ltd.  
St. Thomas, Ontario



### Folex Patent To V-C

U. S. Patent 2,955,803, covering a method of defoliating cotton by applying tributyl phosphorotri-thioite, has been issued to Virginia-Carolina Chemical Corp., Richmond, Va.

The V-C phosphorus chemical, which is the basic ingredient used in the formulation of the company's defoliant, is sold commercially as merphos, while the defoliant, is retailed commercially under the trademark Folex. Dr. William P. Boyer, vice-president in charge of the company's chemicals division, said that now that the patent has been issued, "we plan to carefully and actively police our exclusive patent rights to the use of merphos in defoliants."

### NPFI Books On Sale

The National Plant Food Institute, Washington, D. C., is offering two of its books, *Hunger Signs in Crops* and *The Care and Feeding of Garden Plants*, at reduced prices. The books now are offered at \$1.50 and \$1 per copy, respectively, to domestic addresses.

### Pyrethrum May Lead Exports

N. H. Hardy, executive officer of the Pyrethrum Board of Kenya, forecast recently that pyrethrum might well become Kenya's foremost export industry. Whereas five years ago, he said, the number of African growers had been only 500, the number today has risen to 16,000 compared with the 1,042 European growers.

Also taken into consideration is the amicable settlement of the protracted dispute between the Pyrethrum Board of Kenya and Mitchell Cotts. Both companies have issued announcements stating that their organizations will cooperate in the future development of the Kenya pyrethrum industry. A second processing factory, to be completed in mid-1960 is expected to bring total processing capacity to more than 16,500 tons of flowers per year.

### Hercules Appoints Hellekson

Hercules Powder Co., Wilmington, Del., has appointed Spencer H. Hellekson, formerly assistant director of operations for the Paper Makers Chemicals Department, to be assistant general manager of the Naval Stores Department. He joined Hercules in 1939.

### IMC Reports New Potash Mine

Shaft sinking at the potash mine which International Minerals & Chemical Corporation (Canada), Ltd., has under construction near Esterhazy, Saskatchewan, is now well into the water-bearing Blairmore sands and "proceeding satisfactorily," according to T. M. Ware, IMC president.

The mine is expected to go into production in fiscal 1961-62, reported Mr. Ware to IMC stockholders last month, opening up the world's largest high grade deposit of potash. A surface refinery is now virtually complete.

### Monsanto Appointments

An advertising and promotion manager and a marketing services manager have been appointed for Monsanto Chemical Company's recently formed Agricultural Chemicals Division in St. Louis, Mo.

Eugene D. Smith of El Dorado, Ark., will have responsibility for advertising and product promotion programs for the new division. He formerly served as advertising manager for the Lion Oil Company, a division of Monsanto.

Robert E. Ude of St. Louis will be responsible for the marketing services function, including sales forecasting and sales training programs, along with establishing and coordinating a variety of sales office operating procedures. He formerly managed sales office operations for the company's Marketing Services Department.

### Two Join Sulphur Group

Dr. Rene Leclercq has been appointed vice-president of the Sulphur Institute, Washington, D. C., and Dr. Marion D. Barnes has been appointed industrial research director. Dr. Leclercq had been research director for Union Chimique Belge in Belgium since 1956.

Dr. Barnes formerly was assistant research director with Monsanto Chemical Co.'s Inorganic Division.

### Southern Weed Meeting

The latest trends and tests results on use of herbicides to control weeds in the South will be discussed during the 14th annual Southern Weed Conference, January 18-20, in the Soreno Hotel, St. Petersburg, Fla.

The program will include sections on weed control in specific crops, control in pastures and turf, brush and weed control in non-crop areas, fundamental aspects of weed control, control of specific weeds, horticultural weed control, aquatic weed control, extension aspects of control, public health aspects, and new developments.

### FFVA Officers Re-elected At 17th Annual Meeting



Re-elected to serve another year by the Florida Fruit and Vegetable Association at its 17th annual convention in Miami Beach, Fla., recently, were: (left to right) Joffre C. David, Orlando, secretary-treasurer; Roy Vandegrift Jr., Pahokee, vice president; and J. P. Harlee Jr., Palmetto, president.

**WETTABLE POWDER INSECTICIDES  
ARE MORE POTENT  
REMAIN FREE-FLOWING...**



***when formulated with***

**CELITE**

***diatomite fillers***



The ability of Celite\* diatomaceous silica to absorb its weight in water or oil pays off for insecticide formulators in two ways. (1) Celite absorbs large quantities of liquid poisons while retaining the easy-to-handle properties of a dry dust. (2) Celite's powerful anti-caking action keeps dusts free-flowing and assures uniform poison dispersion in wettable powders prepared by final packagers.

Pound for pound, Celite gives you far greater performance than other inerts since only ten pounds give you a full cubic foot of extender. Celite gives you far greater value since it absorbs up to 50% more poison than other diluents on a dollar-for-dollar basis.

A Celite field engineer will be glad to give you the full story. Call your nearest J-M office or write Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

\* Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

**Johns-Manville CELITE**  
INDUSTRY'S MOST VERSATILE MINERAL FILLER



### **Pennsalt-Nutrilite Program**

Nutrilite Products, Inc., Buena Park, Calif., and Pennsalt Chemicals Corp., Tacoma, Wash., announced last month that the companies are in the process of completing details for a joint effort in manufacturing and marketing biological insect control products. An agreement for exclusive national representation is expected to be reached shortly.

Nutrilite Products, Inc., has just received notice of registration from the U. S. Department of Agriculture, Washington, D. C., for Biotrol, a biological insecticide product, containing *Bacillus thuringiensis*, Berliner, as its active ingredient. Registration has also been granted by the State of California. Previous to this, an exemption from tolerance was obtained from the Food and Drug Administration, Department of Health, Education and Welfare, Washington, D. C.

At present, Biotrol has been registered for the control of imported cabbageworm, cabbage looper, artichoke plume moth, and tobacco hornworm on broccoli, cabbage, cauliflower, celery, lettuce, potatoes, artichoke, and tobacco.

In the impending cooperative effort, officials of both companies have stated that Pennsalt Chemicals Corporation, through its Agricultural Chemicals Division, will contribute its experience in marketing, field trials of new products, market studies, etc. Nutrilite Products Inc., will continue its research activities, encompassing insect pathology, insect entomology, biology, and biological process development, and will produce the biological insecticide products.

### **Chemical Market Abstracts**

Chemical Market Abstracts, Foster D. Snell, Inc.'s chemical marketing literature service has published an index to the issues of Chemical Market Abstracts covering the past five years. Comprising one 654-page volume, the Five-Year Index is designed to as-

sist Chemical Market Abstracts users in the compilation of market studies. A single reference to the Index will, for example, locate virtually every reference made to a particular company in the trade literature for the past five years. The user then turns to Chemical Market Abstracts for abstracts of the news of that company and references to the original articles. Approximately 14,000 companies of the world are indexed, with some of the larger companies having several hundred individual listings. In addition, Patents, Trade-Marks, and Foreign Countries are indexed for the same period.

The CMA Five-Year Index is priced at \$50 per copy.

### **Aquatic Weed Meeting**

The Aquatic Weed Control Society will hold its 2nd annual meeting at the LaSalle Hotel, Chicago, on Feb. 14 and 15, 1961.

### **Chemico Announces New Urea Production Process**

CHEMICAL Construction Corporation, New York, designers and builders of plants for the production of fertilizers, chemicals, and petrochemicals, announced last month a more efficient process for the production of urea.

A versatile, soluble solid, urea, the highest nitrogen content fertilizer, is also finding ever increasing use as a cattle feed supplement and as a raw material in the making of plastics, resins and pharmaceuticals.

The process employs the principle of carbamate solution recycle, which facilitates the complete consumption of the ammonia and carbon dioxide used as raw materials. A simple operation that requires a minimum amount of equipment, it utilizes only a small quantity of water for the recycle of unconverted ammonia and carbon dioxide. This results in a high concentration of urea product before the evaporation stage.

Lucien Cook, chief engineer, states that though there are other processes available which also em-

### **Niagara Regional Managers**

E. W. Kaegebein and F. R. Racine have been appointed regional managers in the southeastern agricultural department by Niagara Chemical Division of Food Machinery and Chemical Corp., Middleport, N. Y. At the same time, Dr. Oscar F. Hobart Jr. was named the department's technical-service-to-sales representative.

### **CSMA Proceedings**

The "Proceedings of the 46th Mid-Year Meeting" of the Chemical Specialties Manufacturers Association has just been published. Its 256 pages contain all papers, discussions and committee reports presented at the meeting, held in Chicago last May. Copies may be obtained at \$7.50 per copy, postpaid to other countries, by writing Chemical Specialties Manufacturers Association, 50 East 41st Street, New York 17, New York.

play the carbamate solution recycle method, the new Chemico technique is superior because it makes possible a marked reduction in initial investment on the part of urea producers, and lowers utility and maintenance costs.

Also, it provides longer "on-stream" time, allowing the plant to run for extended periods without shutting down for maintenance and adjustments.

The new process already has had its first practical commercial acceptance by the Cooperative Farm Chemicals Association, Lawrence, Kansas.

Mr. Cook indicated that Chemico already has a well-accepted urea process which is in successful operation in a number of plants throughout the world. Chemico, however, like a number of other firms in the field of urea technology, has been carrying on a continuous program of research to improve the economics of urea production. Chemico's new process, he pointed out, is the result of this work.



## Liquid Nitrogen Distribution In Nebraska and Kansas

**I**N General Report 82, prepared by the Farmer Cooperative Service, U. S. Department of Agriculture, B. H. Pentecost reports on a study of liquid nitrogen distribution by local cooperatives in Nebraska and Kansas. The study deals with 17 local cooperatives that are affiliated with Consumer Cooperative Association (CCA) of Kansas City, Mo.

Of the 17 cooperatives, 12 were distributing anhydrous ammonia and 14 were handling nitrogen solutions. Nine of the 17 distributed both types. All cooperative associations distributing anhydrous ammonia had begun such operations before 1956 and were, therefore, well established. Only four associations, however, had begun distributing nitrogen solutions before the spring of 1959.

The 12 associations distributing anhydrous ammonia owned a total of 20 bulk storage tanks ranging in size from 6,000 to 30,000 gallons. The 30,000-gallon tanks were most common and ranged in cost from \$9,000 for a used tank to \$19,200 for a new tank complete with an aluminum pumphouse. The minimum cost of a 30,000-gallon tank, complete and ready to begin operations, was approximately \$13,400. If a delivery and application service was offered, the total investment increased according to the number of nurse tanks and applicators used.

Six cooperatives distributing nitrogen solutions owned aluminum storage tanks and eight owned mild steel tanks. The cost of mild steel tanks was about half that of aluminum tanks of equal size. In addition to bulk plant facilities, most associations also owned nurse tanks and applicators and performed a custom application service for patrons or furnished them equipment on a rental basis.

Anhydrous ammonia accounted for 70 per cent of the nitrogen fertilizers sold and for 66 per cent of all fertilizers sold by

the reporting associations in 1958-59. The average sales of anhydrous were \$111,021 per cooperative.

All cooperatives included in the study obtained anhydrous from their regional association, CCA, which operates a plant at Lawrence, Kansas. The cooperatives purchased solutions from several sources, and many were experiencing difficulties in obtaining adequate supplies in the spring of 1959.

Five associations reported they operated on a cash basis. Credit policies of nine varied from 10 to 30 days, with some offering incentives to encourage early payment. Three cooperatives did not have a definite credit policy.

Three associations provided custom application services to patrons for anhydrous ammonia. Rates ranged from \$1.25 to \$1.50 an acre. Six associations performed such a service for nitrogen solutions, with charges usually ranging from 50 to 75 cents an acre. Twenty-three applicators for nitrogen solutions were available for rental to patrons from 11 associations. Most charged from 25 to 50 cents an acre. Two charged three-fourths of a cent per pound of nitrogen and one made no charge.

Eight cooperatives were using the services of 28 private custom applicators for nitrogen solutions as a means of increasing services to patrons and improving the cooperatives' distribution systems. Five cooperatives paid the applicators for their services, and the patrons of three associations dealt directly with applicators.

Other services included soil sampling by eight associations, field personnel to assist farmers with application problems by nine, and an inventory of parts and hoses for solutions by 12 associations.

Twelve of the 17 managers interviewed said liquid fertilizers were causing dry nitrogen sales to decrease. Nine of the 12 said that

their dry sales had been almost or completely eliminated. Thirteen associations expected farmers to use considerably more liquid nitrogen in the future. They also expected the number of distributors to increase. Therefore, 10 of the 17 associations surveyed were planning to expand facilities or to begin distributing both types of liquid nitrogen fertilizer.★

## New Ethion Label Claims

The U. S. Department of Agriculture has approved new label claims for ethion formulations in the control of lygus bugs and other mirids on cotton. Ethion is a product of Niagara Chemical Division of Food Machinery and Chemical Corp., Middleport, N. Y.

Ethion 4 emulsifiable concentrate now can be applied to cotton to curb lygus bugs and other mirids at a rate of 2-3 pints per acre in sufficient water to cover. Similarly, a rate of 25 to 40 pounds per acre has been accepted by USDA for ethion 4 dust.

## Aron Joins Harris Labs.

Harris Laboratories, Inc., Lincoln, Nebr., has appointed C. Gilbert Aron as manager of its agricultural chemistry division. He formerly was chief analyst with Farm Crops Processing Corp., Omaha, and, more recently, had been chief chemist for Lincoln Grain Exchange.

## IMC To Purchase Rauh & Sons

International Minerals & Chemical Corp., Skokie, Ill., has contracted to purchase E. Rauh & Sons Fertilizer Co., Indianapolis, Ind., which operates three plants and sells in a five-state area covering Illinois, Wisconsin, Indiana, Ohio, and Michigan.

The purchase of the company, with plants in Indianapolis, Plymouth, Ind., and Sylvania, Ohio, will give International Minerals "effective market coverage in this area where the use of fertilizer has grown most rapidly," John Zigler, vice president of I. M., said.





## One bag shattered . . . the other has two-way stretch

The *unbroken* bag is made of H&W's new high-strength Expanda-Kraft.

As the lift truck braked to a sudden stop, both bags flew through the air and fell hard against the concrete floor. The regular kraft bag split open — note the spilled flour. Yet, look closely at Expanda-Kraft. *Not a sign of breakage!* Naturally, both bags were identical in basis weight and number of plies.

Expanda-Kraft is stronger, because it's made by a special roll-crepe process. It's resilient, has two-way stretch that soaks up shock. Available in white, semi-bleached and natural.

Expanda-Kraft comes in 40, 50, 60, 70, 80 and 100-pound basis weights. *For samples and information,* write Hollingsworth & Whitney, Division of Scott Paper Company, Chester, Pennsylvania.

# EXPANDA-KRAFT®

**HOLLINGSWORTH & WHITNEY** DIVISION OF  
 **SCOTT PAPER COMPANY**  
 AGRICULTURAL CHEMICALS

## Farm Fertilizers Inc. Merchandising Program Based on Dealer Schools and On-Job Training

FARM Fertilizers, Inc., of Omaha, Nebraska have recently inaugurated an intensive merchandising program to fertilizer dealers. This dealer program is an on-the-job training program, and consists of a series of dealer schools throughout the year.

Meeting for their first two day session in Omaha, Nebraska, late in September, some 20 dealers were welcomed by Richard E. Bennett, president of Farm Fertilizers, Inc. "We have embarked on this program because we believe in the future of the fertilizer industry and the fertilizer dealer," Mr. Bennett told the group. "The traditional method of simply selling tons of fertilizer without an adequate profit margin for the dealer is on the way out. No longer can we sell a farmer what he considers to be the right grade and application of fertilizer and then sit back and hope, by some stretch of the imagination, that he will get maximum yields with minimum production costs. Farmers in the future will demand that we perform a service to justify their business. Farmers want and expect you to make a reasonable profit on the merchandise you sell them, but they likewise demand that you earn their business by performing the services which will satisfy their needs. We must adjust our selling procedures to fit the farmer's needs. That is the purpose of the meetings. You will be proud to be selling the fertilizer your customers need and at the same time

make the kind of margins you need."

Thus began the two day meeting in Omaha September 27th and 28th which was followed by another two day meeting attended by another 20 "Bumpero" dealers in Atlantic, Iowa, September 29th and 30th.

Ralph Everett, sales consultant of Miami, Florida was employed to organize the curriculum. Following Mr. Bennett's welcome to the group, Mr. Everett explained how the course of the meetings would be conducted. "Knowing the technical features of your product is the first step in learning to sell. Each two day school concerns: (1) technical subjects and (2) selling fundamentals.

Leonard Brannan, vice-president of Farm Fertilizers, Inc., presented the technical portion of the two day schools at Omaha, Nebraska and Atlantic, Iowa. Step, by careful step, Mr. Brannan took his class through the story of soil chemistry, and the reasons why a modern fertilizer is manufactured by chemically combining the elements for greater plant response bringing higher yields and cutting crop production costs. The class study is followed by a tour of farms, where dealers are instructed how to correctly map a field, gather complete cropping history of the field, and collect a composite soil sample.

Following the technical knowledge of fertilizers and the relation to economical growth of crops.

discussion shifts to practical sales techniques and how to use the technical information in selling farm customers.

Three additional meetings will be held during the next year.

Each subsequent meeting scheduled for December, March and September will see the curriculum intensified in technical knowledge. Some of the industry's best men as well as college authorities will participate in the teaching to make certain that every dealer is an authority in his community on growing crops.

### Naugatuck General Manager

Dudley Chittenden has been appointed general manager of the Naugatuck Chemical division of U. S. Rubber Co. He succeeds Earle S. Ebers, who has been named a group vice president of the rubber company in charge of its polymer, fiber and chemical operations.

### Dow Promotes New Herbicide

Dow Chemical Company is introducing its first product for home lawn care, — a crab grass herbicide. The product is based on "Zytron," a non-arsenical weed control compound, said to show good selective control of crabgrass on turf.

Dow has conducted four years of performance tests, and two years of market studies, and is now introducing the new product in 14 north central and northeastern states.

John H. Prine has been named to head a newly-formed lawn and garden production section of Dow's agricultural chemicals sales department, which will handle the product.

### To Offer "Soil Additive"

Sun-Gro Minerals, Inc., Delta, Colo., plans to construct a plant in Delta to manufacture a "soil additive" to be marketed under the trade name of Sun-Gro.

It is to be produced from iron oxide and decomposed sulfur present in extensive open pit mines ten miles south of Delta.

Bumpero Corp consultants learn proper way to take soil samples.



### New Hooker Appointments

J. Howard Brown, Robert F. Schultz, and Dr. Alvin F. Shepard have been named to new posts in a realignment of the corporate research and development department of Hooker Chemical Corporation, Niagara Falls, N. Y., according to Dr. Chris A. Stiegman, newly elected vice-president of research and development.

Dr. Brown has been appointed manager—research; Mr. Schultz, manager—process development; Dr. Shepard, senior scientist—all reporting to Dr. Stiegman. They had been respectively manager—chemical research, production manager—Eastern Chemical Division, and manager—plastics research.

### Fertilizer Deficiencies

A summary of samples of commercial fertilizer inspected in South Carolina by Clemson College fertilizer inspectors during fiscal year 1959-60 reveals that 6.62 per cent of samples inspected were deficient in one or more plant food ingredient or excessive in chlorine. Some 5,239 samples were tested.

Clemson inspectors also weighed 1,654 lots of commercial fertilizer during the year. Of these, 6.1 per cent were found to be short weight lots.

### Dozier Joins CSC Staff

G. L. Dozier has been named to the agricultural chemical sales staff by Commercial Solvents Corp., New York. His headquarters are in the company's Atlanta, Ga., office.

Mr. Dozier has been associated with the fertilizer industry for the past 16 years. Prior to this, he was with the U. S. Department of Agriculture.

### Offers Consultant Services

Dr. Oscar F. Hedenburg resigned recently from the Mellon Institute, Pittsburgh, and announces he will continue working in the industry as a consultant. Dr. Hedenburg is well known in the industry for his research on

the development of piperonyl butoxide.

As a consultant, Dr. Hedenburg will concentrate on matters dealing with product development and evaluation and chemical testing. His office is located at 144 N. Dethridge St., Pittsburgh 13, Pa.

### Naugatuck Appoints May

Edward W. May has been appointed eastern district manager for Naugatuck Chemicals division of Dominion Rubber Co. Ltd., Montreal, Canada. He is in charge of sales of all Naugatuck products in eastern Ontario, Quebec, and the Atlantic provinces.

### A New Package for Montgomery Ward Plant Foods

by D. W. Hallman  
Lawn and Garden Department  
Montgomery Ward & Co.

WHEN we decided to market a new line of lawn and plant foods three years ago, we had three specific packaging problems.

1. Moisture: the foods were of a "hygroscopic" nature and would cake if moisture got into the package.

2. Durability: the food is made in 18 plants around the country, for shipping to more than 1,000 Montgomery Ward retail and catalog outlets, plus a system of mail order houses and distribution centers. The package would have to stand up against repeated shipping and rough handling.

3. Marketing Values: we wanted a packaging material which would enhance the design.

Wards' own design department came up with a colorful package. For technical assistance and a solution to the three problems mentioned above, we went to Union Bag-Camp Paper Corp.

The result, a multiwall, open-mouthed bag coated with polyethylene, is both attractive and durable. The polyethylene coating, provides an effective moisture barrier, strengthens the paper, and prevents chafing when the bags

### Allied Advances Shirley

James G. Shirley has been appointed central district field sales manager for agricultural chemicals produced by Allied Chemical's General Chemical Division. In his new post, he will supervise sales in Illinois, Iowa, Kansas, Missouri, and Nebraska. His headquarters are at General's St. Louis sales office.

### Clemson Fertilizer Meeting

The annual Clemson College fertilizer meeting for manufacturers, dealers, and salesmen will be held Jan. 12 at the Wade Hampton Hotel, Columbia, S. C.

are transported, loaded or stacked for warehousing.

The glossy finish also brings out the bright greens and white of the design, which were chosen to catch the eye of the shopper and carry out the garden theme. The uncoated bags we had used previously toned down the colors, and thus the display values.

We also were pleased with the ease of cleaning the bag. Dust gathering on merchandise items is every merchandiser's headache. But a light wipe with a damp cloth is all that's needed to keep our displays looking fresh and new.

Don W. Hallman, (left) the author, stands by as a warehouse aid demonstrates the handling ease of the lawn and plant food bags at Montgomery Ward warehouse in Chicago. With Ward's many mail order houses and retail outlets from coast to coast, the bags are exposed to a great deal of loading, unloading, and shipping.



AGRICULTURAL CHEMICALS



## NEWS BRIEFS

W. R. FORT, manager of the Florida Phosphate Division of W. R. Grace & Co., Davison Chemical Division, Bartow, Fla., has been appointed by Gov. LeRoy Collins as a member of the 10-man Florida Air Pollution Control Commission.

AC

ROBERT J. DAY has joined the Joseph L. Prosser Co., Glenarm, Md., as secretary of the company.

AC

GLEN B. MILLER, president and chief executive officer of Allied Chemical Corp. until his retirement last September, has been named co-chairman of the 1961 New York March of Dimes.

AC

ROBERT P. MASON has been appointed sales representative in east-

ern Illinois for F. S. Royster Guano Co., Norfolk, Va.

AC

JULES C. LAEGELER has been appointed vice-president in charge of engineering by the Frank G. Hough Co., Libertyville, Ill. He has been with the company since 1951.

AC

L. A. ROWDEN has been named sales manager of the Omaha sales division by Bemis Bro. Bag Co., St. Louis, Mo.

AC

AMERICAN MINERAL SPIRITS COMPANY, Western Los Angeles, announced the appointment of John G. Locke to the position of assistant sales manager of Amco's Southern California Division.

AC

WALTER S. BETZ, assistant director of traffic for Monsanto Chemical Co.'s Inorganic Chemicals Division at St. Louis, has been transferred to the company's Agricultural Chemicals Division in the same capacity.

WITTS FERTILIZER Co., Norwich, Ontario, Canada, recently completed 1,610 calendar days without a lost-time accident.

AC

EUGENE W. GEHM has been named sales manager of Vulcan Containers Inc., Bellwood, Ill. He had been assistant sales manager.

AC

SMITH-DOUGLASS Co., Norfolk, Va., has been named R. D. Tayloe assistant to the fertilizer division production manager.

AC

ERNEST M. STODDARD, plant pathologist, was awarded a 50-year service pin, Dec. 16, by the Connecticut Agricultural Experiment Station, New Haven.

AC

RICHARD G. TOUSEY has been appointed product supervisor for American Cyanamid Company's herbicide and fungicide products. He had been promotion manager for Cyanamid's phosphates and nitrogen department.

New! on MICHIGAN AVE. at 12th St. in Chicago!

Modern Luxury in  
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## Extensible Paper Bags Used By Shell Chemical For Packaging Fertilizers and Polystyrene Resins

SHELL Chemical Company now packages 65-70% of its fertilizers and polystyrene resins in multiwall bags made of Clupak extensible paper, and expects this percentage to increase.

The company has found that these bags which it purchases from several suppliers cost less than comparable kraft bags and that they fill easier.

Ammonium sulphate, tri-super phosphate, ammonium phosphate sulphate and diammonium phosphate are packaged in 80 and 50-lb.-capacity bags, and the polystyrene — a new product for Shell — is packaged in 50-lb. bags. The design of the imprinting for the polystyrene bags marks a departure from the traditional Shell bag design, and was created by Raymond Loewy Associates especially for the new product.

The Clupak extensible paper bags used for the fertilizers are three ply — two plys of 50-lb. basis weight and one ply of 70-lb., for a total basis weight of 170 lb. This compares with four-ply kraft bags made up of one 40-lb. ply, two 50-lb. plys and one 60-lb. ply, for a total basis weight of 200 lb. Thus, there is a basis weight saving of 30 lb.

Clupak extensible paper bags for polystyrene are of five-ply construction — three of 40-lb. basis

weight and one each of 50 and 60-lb. basis weight. Total basis weight is 230 lb. Kraft polystyrene bags also are five-ply units but four of these are 50-lb. basis weight and one is 60-lb., for a total basis weight of 260 lb. Thus again there is a reduction of 30 lb. in basis weight.

Shell Chemical's new polystyrene bag was given a new design because the marketing department felt this was an opportunity to take advantage of modern packaging design knowledge to gain maximum product identity. Bags for established products have not been changed, the feeling being that the market is familiar with the present design and to change might lose more than would be gained.

Shell has standardized on valve-type bags, the valve being folded over and tucked inside the bag when the bag has been filled.

### Carbyne Tested On Oats

Spencer Chemical Co., Kansas City, Mo., has reported the results of tests with Carbyne herbicide on more than 16,000 acres of wild oat-infested cropland last summer. P. W. Gull, the company's manager of agricultural research and development, said that Carbyne did an effective job of post-emergence wild oat control during the tests.

### Stedman Fact Sheet

Stedman Foundry and Machine Co., Aurora, Ind., is offering a bulletin that describes its Model RO batch mixer. The mixer is equipped with four-wheel drive rubber-tired trunnions.

Streamline design reduces overall weight and floor space required. Tires, ring gear, pinion, pinion shaft, and bearings have been eliminated.

### Renneburg Offers Bulletin

Edw. Renneburg & Sons Co., Baltimore, Md., is offering a 16-page bulletin that describes dryers, calciners, kilns, coolers, coaters, spheroidizers, flash drying equipment, refractoryless furnaces, combustion equipment, pug mills, and other specialized machinery. Included are more than 75 photographs, as well as numerous drawings and diagrams. The bulletin, G560, may be obtained from the company at 2639 Boston St., Baltimore 24.

### Versatile Spreader Booklet

Baughman Manufacturing Co., Jerseyville, Ill., has prepared a booklet to describe its "Quick Spread" fertilizer spreader. Among the features listed for the spreader are wide spreading pattern, self-cleaning, and versatility. The overall width and height of the spreader—58 inches wide by 45 inches high—allow it to go wherever the tractor goes. Capacity of the spreader is 2,000 pounds of a 60 pound material and the 18 inch fan spreads fertilizer over a 32-foot swath. The booklet is available from the company.

### CSC Net Earnings Up

A 59 per cent increase in net earnings for the first nine months of 1960 has been reported by the Commercial Solvents Corp., New York. Net earnings totalled \$3,637,277 and are the company's highest net earnings for the first three quarters since 1951. Earnings for the same period last year were \$2,285,061.



## 1st Phosphate From Senegal

The first phosphate to be commercially exported from the Republic of Senegal was shipped recently by Compagnie Senegalaise des Phosphates de Taiba. The shipment, bound for Rotterdam, consisted of 10,000 metric tons of phosphate.

## International Market Round Up

WHILE fertilizer supplies in the U. S., particularly of nitrogen, triple superphosphate, phosphate rock and potash, are in fairly tight supply, stocks are being accumulated in certain nitrogenous materials in Europe, due to the fact that Communist China, which normally is a substantial buyer of ammonium sulphate and other types of nitrogenous fertilizer, has not yet started to purchase for the current year.

Sales to the Chinese mainland during 1959 were as follows:

From Germany: Metric Ton

|                    |         |
|--------------------|---------|
| Ammonium Sulphate  |         |
| Calcium Cyanamid ) | 67,602  |
| Ammonium           |         |
| Sulphate Nitrate   |         |
| Calcium            |         |
| Ammonium Nitrate   | 134,900 |
| Total              | 202,502 |

From Belgium:

|                   |         |
|-------------------|---------|
| Ammonium sulphate |         |
| Ammonium          |         |
| Sulphate Nitrate  | 297,997 |
| Ammonium Nitrate  | 99,860  |
| Total             | 397,857 |

From Italy:

|                  |         |
|------------------|---------|
| Ammonium Sulfate | 268,917 |
| Urea             | 20,764  |
| Ammonium Nitrate | 71,026  |
| Total            | 360,707 |

From Holland:

|                   |        |
|-------------------|--------|
| Ammonium Sulphate | 40,366 |
| Urea              | 11,329 |
| Ammonium Nitrate  | 30,907 |
| Total             | 82,602 |

From France:

|                   |        |
|-------------------|--------|
| Ammonium Sulphate | 10,000 |
|-------------------|--------|

From England:

|                   |     |
|-------------------|-----|
| Ammonium Sulphate | 149 |
|-------------------|-----|

via Hong Kong

|                   |        |
|-------------------|--------|
| Ammonium Sulphate | 26,256 |
| Total             | 26,256 |

From Austria:

|             |           |
|-------------|-----------|
| Others      | 118,396   |
| Grand Total | 1,198,469 |

Compiled by International Ore and Fertilizer Corp., New York

Cutback in deliveries of imported muriate of potash by about 8%, and a threatened rail strike in Canada may seriously affect the flow of potash into fertilizer plants. The cutback may mean a loss of 16-18,000 metric tons in the U. S. imports between now and April, 1961.

## PRODUCTION CLINIC

(From Page 43)

sparger hole size and number of sparger holes.

### Quality Control

"A discussion of the benefits of Quality Control is not unlike a politician being for home and motherhood," jested the speakers. "Almost everyone is for it, but not all agree to what extent quality control should be used. There is not even agreement as to how necessary it is."

IMC's technical service staff points out that Quality Control is needed to get information, — to obtain operating data, to determine the costs of a given product, to ascertain efficiencies of current processes, to develop new processes, to prevent monetary losses, etc.

Discussions at the production clinic include: a review of sampling and sampling methods,—use of a materials inventory sheet, formulation sheet, batch control sheet, continuous process data sheet, shipping sheet, distribution pattern. Use of this data is required to control quality, and costs in processing. "These," it is pointed out, "are the mechanics of a sound quality control program. It is not difficult, but it does require careful and regular sampling at all stages of processing and accurate recording."

What about laboratory costs? —"As a general rule, a plant making up to 25,000 tons does not require a complete laboratory. If the production is over 25,000 tons per year, a plant should have its own laboratory. However, one must consider the advantages of production control for their own individual case and evaluate the need for in-process data vs cost. A simple laboratory for nitrogen determination may easily pay for itself in the case of high production rates or prolonged periods of continuous operation. Quality control is not just a working tool for the large manufacturer. It is a good economical tool for the small fertilizer manufacturer."



## Glendon's INSECTICIDE GRADE PYROPHYLLITE

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★ *Superior Adhering Properties*—Because it is difficult to wet, Glendon's Insecticide Grade Pyrophyllite clings firmly to plant leaves even through heavy rains.

★ *Superior for Aerial Application*—When used as a carrier in dusts for aerial application, Glendon's Insecticide Grade Pyrophyllite has been demonstrated to settle more quickly than other diluents, thus minimizing the hazards of drift, waste of toxicant and failure to hit target areas.

## GLENDON DIVISION

CAROLINA PYROPHYLLITE COMPANY

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## FLORIDA RES. INST.

(From Page 39)

to develop the most accurate means of manufacture and control of fertilizers which can be obtained. During the last two years this committee plus the two public agency participants have continued in their efforts, and a new method for analysis will soon be reported which will allow the guaranteeing of water soluble manganese in fertilizer—a further safeguard for the farmer who buys fertilizer. It is also hoped someday to have an analytical method for chelated metals in fertilizer.

The Fertilizer Industry Control and Standards Committee has a counterpart for pesticides called the Pesticide Industry Control and Standards Committee. This latter committee has been equally helpful to the pesticide industry, but because of the rather homogeneous mixtures which usually occur in pesticides, sampling of pesticides has never been nearly the problem which has occurred with fertilizers.

FARI has cooperated in pesticide matters with the Florida State Board of Health and other groups in developing workable regulations and safety measures governing the use of highly toxic pesticides in residential areas.

The FARI staff collects and distributes information to its members on subjects which affect the two industries. These are many and varied and are such items as information on current research, Federal Register Extracts, committee reports, news of an industry nature, etc., etc. In other words, FARI collects and distributes information on many subjects, but has generally neglected itself. "This is a field we have failed to cover," said Mr. Holland. "We have no printed literature about our own organization. Perhaps we could secure more members and gain more support if we published a brochure or something about FARI. But we have been so busy on more important matters, we

have neglected ourselves. FARI has no publicity man." This statement seems to typify FARI.

In short, the philosophy of FARI is to get the job done for agriculture, and not to try to get the credit for doing the job.★★

## FERTILIZER SOLUTIONS

(From Page 34)

try has failed, however, is in the business of attempting to match costs with dry fertilizer, he said. Mr. Galloway recommended that the industry concentrate on such factors as ease of handling and saving labor rather than trying to sell in terms of cost. In addition, he said, liquid manufacturers have assumed many services, such as application, that should be taken into account when determining costs.

F. E. Hertzler, controller of Co-Mac, Inc., and an authority on business training, discussed management practices. He said that the fertilizer industry is ready for a good distribution pattern. Sooner or later, he predicted, there must be a system of dealers or a chain-store type operation in the fertilizer industry. A good distribution system is necessary, he said, and independent dealers are not the answer. Mr. Hertzler told the association that the fertilizer industry is going to have to merchandise and will need to employ highly trained and skilled merchants in each plant.★★

## APHID CONTROL

(From Page 65)

means of lessening its toxicity.

Phaltan residues on fruit were reduced more by weathering than by growth. A rapid loss of spray deposit in 1959, 40% to 44% within a week, was evidently associated with high temperatures. In 1958, a similar loss required 2 weeks. In the 4-week period after final spraying, temperature was 85°F or higher in 20 days in 1959, whereas in 1958 it exceeded 85° on only 3 days. During this period rainfall was 1.06 inches in 1958 and 5.69 inches in 1959.

Residue on fresh grapes, sampled 49 days after final spraying, was 2.3 parts per million. Less than 0.1 ppm was found in the extracted juice.

Taschenberg and Braun stated that, since soluble solids content is an important measure of fruit quality, effect of fungicides on soluble solids is an important consideration in spray trials. By this standard Phaltan did not affect fruit quality.★★

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## PEST ROUNDUP

(From Page 63)

Greensville County, Virginia, specimens were collected October 12, 1960, on a strip of land between U. S. Route 301 and the Atlantic Coast Line Railroad within a few yards of the North Carolina line. Additional surveys were undertaken and eradication measures are to be applied.

Last month white-fringed beetle was found in Beaufort County, North Carolina, for the first time. Infestations were recorded in October from Jones, Stanley and Halifax Counties, North Carolina, Benton County, Tennessee and Webster County, Georgia.

Among vegetable insects cabbageworms were the most active over a wide area. Populations of cabbage looper were high on cabbage in central and southwest Ari-

lieve processing costs favor its prozona during early October. Counts were as high as 10-12 per plant in some fields. Egg counts on lettuce were down, but still averaged 7 per plant in some Yuma County fields. In Zavala County, Texas, up to 4 looper larvae per leaf caused heavy widespread damage to cabbage, cauliflower and broccoli. Damage was reported to have occurred in commercial spinach in the Glenarm area, Baltimore County, Maryland.

As of October 30, 1960, only two screwworm cases had been found during the year in the eradication area of the southeastern states. These are the first infestations since the last ones were reported from Florida in June 1959. The most recent find, October 25, was in a racing greyhound at Tampa, Florida. This dog had been shipped from Kansas. Steps are being taken to prevent establishment of the pest in the Tampa area. Previously reported was the finding of a single case in a steer in Geneva County, Alabama, August 31. The animal had been shipped from the southwest. Additional survey was initiated and the area treated with insecticides. No additional infestations have been found in the area.

Other southeastern states reporting screwworms during the season included Arkansas, Louisiana, and Mississippi. Through October, 38 cases from 33 properties in 5 counties in Arkansas, 156 cases from 87 properties in 11 Louisiana parishes and 75 cases from 39 properties in 5 Mississippi counties had been reported.★★

## FERTILIZER VIEWS

(From Page 51)

lieve processing costs favor its production.

Pure crystalline potassium metaphosphate,  $KPO_3$ , has the analysis, 0-60-40. It is only slightly soluble in water. When produced with small amounts of the oxides of iron and aluminum, it takes on a glassy structure and is readily soluble in

water. This product is still in the pilot plant stage.

Potassium pyrophosphate,  $K_2CaP_2O_7$ , produced by fusion of phosphate rock, potassium chloride and gaseous  $P_2O_5$  at elevated temperatures, is another of the potentially useful phosphates. At present it is not produced commercially. In the pure state it analyzes 0-49-32. Pilot plant products have ranged from 0-43-44; 0-51-24; and 0-56-39.

### Water Solubilities

Using potassium chloride as a basis of comparison, greenhouse pot tests reveal these solubilities:

Crystalline  $KPO_3$  and  $K_2CaP_2O_7$ , less than 4 per cent;  $KPO_3$  with impurities 6.5 to 100 per cent.

A supervisor of modern fertilizer plant operations needs to have training and experience in chemical engineering and quality control. Looking back to the operations in plants one or two generations ago, the headaches suffered

then by plant superintendents from labor and equipment causes seem "peanuts" to those that today's operations can generate. But, it's worth it, they tell me.

*"Men, my brothers, men, the workers, ever reaping something new:*

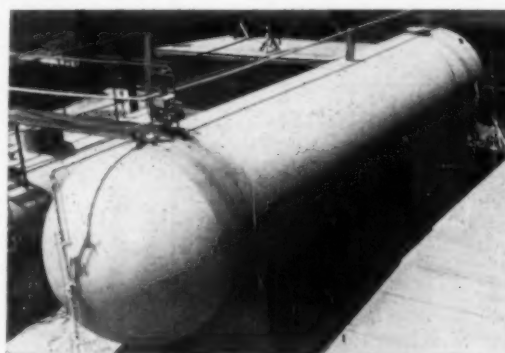
*That which they have done but earnest of the things that they shall do."*

—Tennyson.

## SULFUR

(From Page 41)

tons of plant foods ( $N+P_2O_5+K_2O$ ). Total world production of these same plant foods during the same period amounted to 22,530,000 metric tons. The U. S. A. production of superphosphates (all grades) in 1957-58 was 2,288,756 tons as  $P_2O_5$ ; total world production of  $P_2O_5$  was 7,668,000 metric tons.



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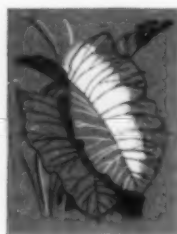
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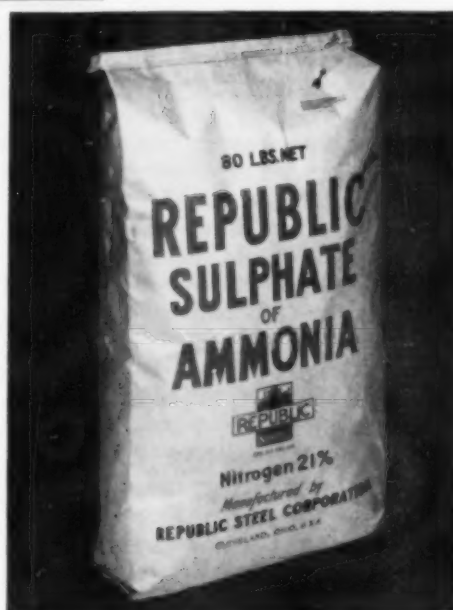
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These are massive quantities of plant foods, and reflect man's present dependence upon chemicals to assure abundance of foodstuffs for himself and his livestock. At least 30 per cent of the total farm production in the United States is attributable to chemical fertilizers. As populations increase and corresponding demands for foodstuffs develop, it will be necessary to expand world production of fossil fuels and sulfur to satisfy these increasing requirements. Fortunate is that country that has a strong, responsive chemical and fertilizer industry to serve its agriculture, in these basic needs.★★

## APPLICATION METHODS

(From Page 57)

spray applied. The ideal application, where spray runs off all the crop surfaces, is rarely obtained. The volumes of spray required are large, and they need to be directed thoroughly to all parts of the spray target. In actuality, large-volume spraying falls short of run-off spraying.

Small-volume spraying is the alternative. No attempt is made in this application method to cover all the crop surfaces. Instead, a patchy distribution is formed. Reliance then is placed on either movement of the insect to contaminated patches or redistribution of the insecticide so that it becomes available to the insect. In this method, deposit density of insecticide usually is proportional both to its concentration in the spray and the volume of spray applied.

These two spraying methods and dusting are different from each other in several ways, so that they are not always equally suitable. Selection of the best method of applying an insecticide and of the best machine is one of the most important jobs of the applicator. A primary requirement in application is to get insecticide onto the crop. Since the chemical is expensive, this should be done with as little waste as possible. On low-growing crops, for example, the

least waste often occurs with small-volume sprays.

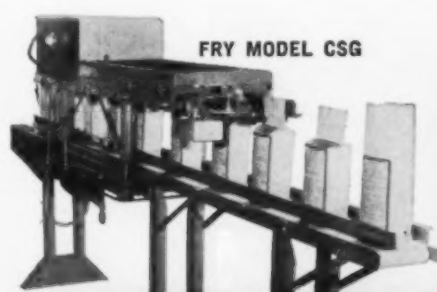
Dust fails partially to impact or adhere. In some instances only 20 per cent of the quantity of dust applied remains on the target crop. (Although this is a typical figure, recovery levels in a particular case depend upon the dust, the target, and circumstances.)

During run-off spraying, part of the spray, of course, pours onto the ground. A wide range of figures are quoted from experimental results obtained with large volume sprays. When fruit trees were sprayed, for example, with 200 gallons of spray to the acre, the volume found on the ground beneath the trees was 160 gallons when they were dormant, but only 20 gallons when they were in full leaf.

The loss to the ground is not caused only by run-off, but also by spray passing between the branches. If 300 gallons were applied to

smaller or larger trees, the losses to the ground might assume different values. Nevertheless, in large-volume spraying, some loss of insecticide to the ground occurs from that part of the crop where the maximum initial retention is exceeded.

In consequence, the fraction of the pesticide landing on the target crop often is greatest when small-volume sprays are applied. The drop sizes in the spray usually are in the range 100 to 300 microns in diameter. This drop size range probably would cause only small alternative losses through drift or spray bouncing. Therefore, if deposition of the spray on the crop is to be taken as a main index of biological effectiveness, small volume spraying usually is the most meritorious. However, the merit of an application method is not determined solely by its effectiveness. Further, effectiveness is not determined by depositions only.★★



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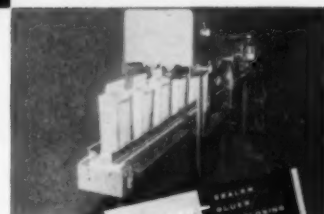
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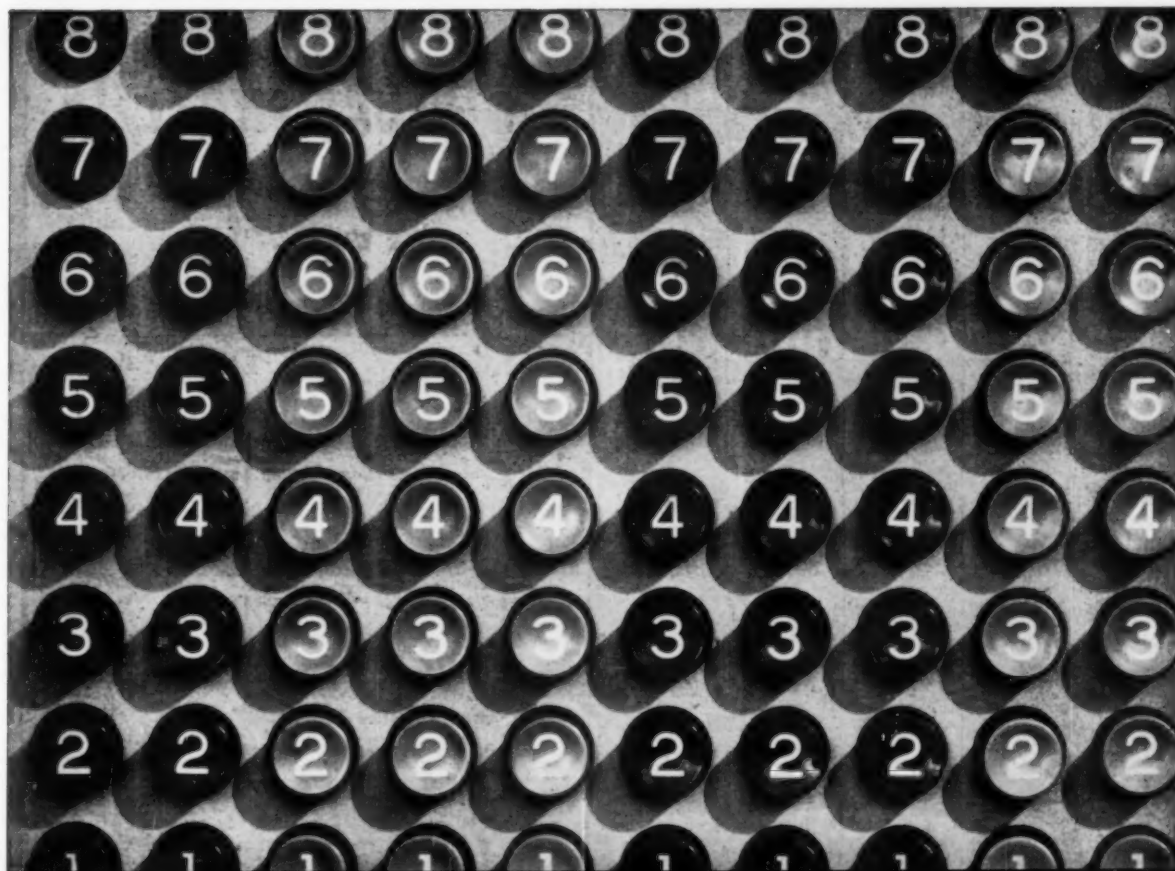
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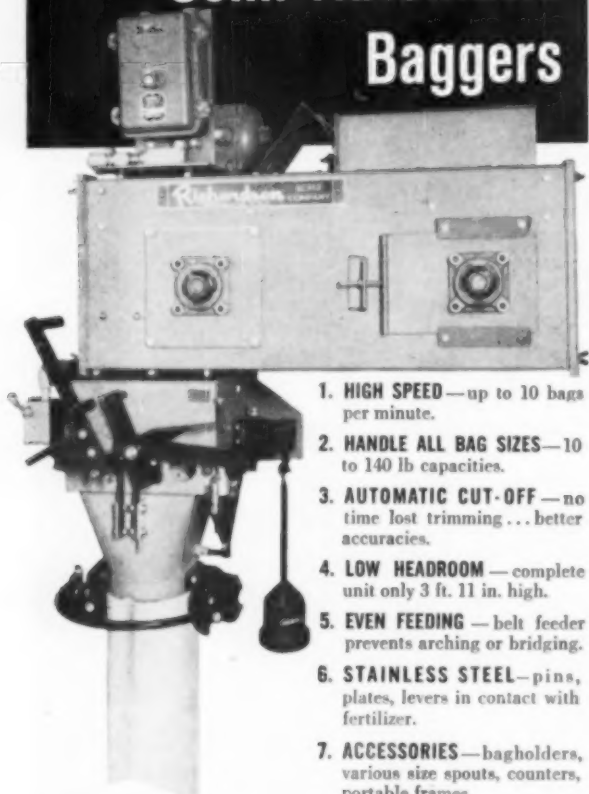
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## LITERATURE AVAILABLE

The bulletins listed below are available from the organizations by which they are prepared.

PEACH FERTILIZER AND PRUNING EXPERIMENTS, by J. P. Overcash, J. A. Campbell, and S. P. Crockett. A report of experiments conducted with Sullivans Early Elberta peach trees at Crystal Springs and Holly Springs, Mississippi, to determine the influence of N, P, and K on tree growth and fruit production. Mississippi Agr. Exp. Sta. Bulletin 596, May 1960.

AC

MAINE FARM RESEARCH. A quarterly report of research programs carried out by personnel of the Maine Agricultural Experiment Station. Published by the Maine Agr. Exp. Sta., University of Maine, Orono, Maine.

AC

COTTON BANDITS. This booklet, based on the slide film, "Cotton Bandits," is intended to provide further information on the problems of cotton insect control. Prepared by Shell Chemical Corp., 500 Fifth Ave., New York 36.

AC

SULFUR DEFICIENCY IN COFFEE, by W. L. Lott, A. C. McClung, and J. C. Medcalf, IBEC Research Institute, 30 Rockefeller Plaza, New York. Sulfur deficiency in coffee trees of Sao Paulo and Parana (Brazil) may be expected to occur with increasing frequency as the use of low-sulfur sources of N, P and K increases. A study of the problem.

AC

NITROGEN FERTILIZATION OF CORN WITH SUPPLEMENTAL IRRIGATION, by O. H. Brensing and H. J. Harper. This publication reports data from tests of various rates of nitrogen fertilization on corn given supplemental irrigation on five farms in central and eastern Oklahoma during the period 1957 through 1953. Oklahoma State University Bulletin B-557, June 1960.

AC

CAUSES OF OUTBREAKS OF STORED-GRAIN INSECTS, by R. T. Cotton, H. H. Walkden, G. D. White, and D. A. Wilbur. The most serious threat to grain after harvest is a group of insects that have adapted themselves to live on dry seeds and other dry vegetable products. Whether or not outbreaks of these pests develop depends on the precautions taken by the individual who stores the grain. Kansas State University Agr. Exp. Sta. Bulletin 416, Feb. 1960.

AC

THE BLACK VINE WEEVIL, by John C. Schread. The most effective method for controlling this pest is destruction of the adult weevils by treatment of the surface of the soil, although injury to leaves caused by adults is less serious than that caused by feeding of the grubs on the roots. Connecticut Agr. Exp. Sta. Circular 211, March 1960.

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### Offers Consulting Service

Dr. Roger W. Roth has announced the formation of a new consulting service, Agricultural Marketing Services, Glenview, Ill., that offers to agricultural chemical manufacturers advice and assistance in specific phases of business operation. Among the services offered are acquisition searches, market surveys, product planning, evaluation and introduction of new products, distribution appraisals, promotion and merchandising, personnel and public relations, and assistance with Federal and State regulatory problems. Dr. Roth is senior consultant for the new firm.

### Continuous Treating System

O'Brien Industrial Equipment Co., San Francisco, has prepared a folder to describe its continuous treating system for granules, seeds and fertilizers. The system, an Impingatron continuous blender, will handle 400 cu. ft. per hour of free flowing solids. The quantity of liquid handled is governed by the viscosity of the liquid. The folder is available from the company at 1596 Hudson Ave., San Francisco 24.

### District Manager For CSC

A. W. Kinnard III has been appointed manager for the south central district of the Agricultural Chemicals Department, Commercial Solvents Corp., New York.

### Chlorate Capacity Increased

Two major construction projects at American Potash & Chemical Corporation's sodium chlorate plants were completed last month. Production capacity at the firm's Aberdeen, Miss., sodium chlorate plant was increased 50 per cent late last month.

### National ESA Meeting in N. J.

Experts on insects all over the world were scheduled to meet at Haddon Hall, Atlantic City, N. J., November 28-December 1, for the annual meeting of the Entomological Society of America.

Dr. L. G. Merrill, Jr., Rutgers, chairman of the arrangements committee, said that from 800 to 1000 of the Society's 4,400 members were expected to attend.

Six sections of the society meeting during the convention include: General Entomology; Insect Physiology and Toxicology; Insect Biology; Medical and Veterinary Entomology; Control Extension and Regulatory Entomology; Chemical Control Investigations.

### Armour Names Pair

Armour Agricultural Chemical Co., Atlanta, Ga., has appointed C. M. Einhorn as new products development manager, and Guilford S. Barteaux as specialty sales manager, replacing Mr. Einhorn.

### Hooker Expanding Production

Hooker Chemical Co., Niagara Falls, N. Y., is expanding capacity for making Oldbury-brand sodium chlorate at the Columbus, Miss., plant of its Eastern Chemical Division. This will be the fourth expansion since the original 12,000-ton-per-year Columbus plant began production in late 1954. Hooker also makes sodium chlorate at Niagara Falls.

### Beltwide Cotton Conference

The 1961 Beltwide Cotton Production Mechanization Conference will be held January 9-13 in Greenville, S. C.

The current and prospective situation affecting use of agricultural chemicals on cotton, will be reviewed by Dr. H. L. Haller, USDA. Walter J. Mistic, N. C. Agricultural Experiment Station, will review the patterns and practices in cotton insect control in the boll weevil area; and Dr. Warren C. Shaw, USDA, will report on progress in weed control research.

### Achievement Award to MacNair



Ira P. MacNair, president of MacNair-Dorland Co., New York, has been selected to receive the 1960 Achievement Award of the Chemical Specialties Manufacturers Association.

The award, which is in the form of a scroll, will be presented to Mr. MacNair during the 47th annual meeting of CSMA at Hollywood Beach, Fla., December 5-9.

Mr. MacNair is being honored in recognition of his contributions to the chemical industry of the United States.

In 1925 Mr. MacNair was one of the founders of his present company which published *Soap* magazine, known today as *Soap and Chemical Specialties*. He has also been a director of Trade Magazines, Inc., publisher of *Pest Control* and an officer of Powell Magazines, Inc., publisher of *Modern Sanitation & Building Maintenance* and *Paint and Varnish Production*. He was also at one time an officer of Industry Publications, Inc., publisher of *Agricultural Chemicals* and *Modern Lithography*.

### New Grace Fertilizer

A magnesium ammonium phosphate fertilizer that will not burn or injure roots or foliage has been developed by W. R. Grace & Co.'s Research Division.

This non-burning plant food can be applied at a heavy rate. It is composed of 8% nitrogen, 40% phosphate and 24% magnesium oxide (8-40-0). Under laboratory conditions seeds germinate and plants grow in this phosphorous containing compound without the presence of soil.

Magnesium ammonium phosphate is especially adaptable for the fertilization of tree seedlings and is recommended for use on turf, citrus fruits, shrubbery, ornamental plants and truck farm crops.

Field tests have indicated a second metal compound, ferrous ammonium phosphate, (7-35-0) to be equally effective in some forestry applications. However, at this time it is primarily recommended for use in nursery beds. When required, a mixed fertilizer may be produced using this new family of fertilizers which will employ all of the essential elements needed for plant life.



## CLASSIFIED ADVERTISING

Address all classified replies to Box Number, c/o Agricultural Chemicals, P. O. Box 31, Caldwell, N. J.  
Rates for "Help Wanted" advertisements are 20¢ per word; minimum charge \$3.00. Rate for individuals seeking employment is 5¢ per word, \$1.00 minimum.  
Advertisements of machinery, products and services accepted at rate of \$10.00 per column inch. Minimum space, one inch.

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F. S. ROYSTER GUANO CO.'s Norfolk sales division, which covers portions of eastern North Carolina and eastern Virginia, will be moved to new quarters this month at the company's Money Point, Va., plant.

AC

GEORGE S. CARTER will represent Ashcraft-Wilkinson Co., Atlanta, in Iowa and adjoining states. He joined Ashcraft-Wilkinson in May as a sales trainee.

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- 1-7'-6" x 62" rotary cooler, ¼".
- 1-Louisville 7' x 70' rot. cooler, ¼".
- 2-Bonnet 7' x 60' rot. dryers, ¾" shell.
- 1-Allis-Chalmers 7' x 50' rot. dryer, ¾".
- 2-Bonnet 6' x 52' rotary dryers, 5/16".
- 1-Louisville 6' x 50' steam-tube dryer.
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### EDITORIAL

(From Page 29)

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JENSEN-SALSBERY LABORATORIES, Kansas City, Mo., recently named Frank T. Jacobs as president and general manager.

The new president of this veterinary pharmaceutical and biological manufacturing firm was formerly vice-president in charge of marketing and new business development of the Wm. S. Merrell Company, another subsidiary of Richardson-Merrell, Inc.

AC

SUMMERS FERTILIZER CO., Baltimore, advises that Jere G. Moynihan, general sales manager for Summers' interests in the state of Maine and New Brunswick, has transferred his headquarters from Sandy Point, Maine to Houlton, Maine.

AC

EAGLE CHEMICAL COMPANY, Inc., Mobile, Alabama, announces the appointment of Frank W. Berryman, Jr., to the post of sales manager. Berryman, born in Jamaica, New York, received his B. S. degree from M. I. T. majoring in Chemical Engineering.

AC

EXTENSION SPECIALISTS from six states met at the North Dakota Agricultural College, Fargo, on November 8 and 9 for a conference sponsored by the Crop Quality Council. Fertilizers, weed control chemicals and barley disease problems were among the items discussed.

AC

STANLEY B. HONOUR has been named as sales manager, International Division, Diamond Alkali Company, New York.



### Fertilizer Handbook Revised

The Soil Improvement Committee of the California Fertilizer Association will distribute a revised third edition of the *Western Fertilizer Handbook* in November.

This issue will contain about 200 pages, as compared with 168 in the first and second editions. With added charts and plates and new text, the book is to be completely up-to-date in subject matter.

First printed in 1953, with 15,000 copies and reprinted in 1954 with 10,000 copies, this handbook covers the subjects written in terms understandable to the lay person. Copies may be ordered on a prepaid basis from the California Fertilizer Association, 719 "K" Street, Sacramento 14, Calif. Price is \$1.50 per copy.

### Three Research Appointments

Three appointments at the research laboratory of Allied Chemical's General Chemical Division, Morristown, N. J., were announced last month. Otto G. Direnga, for the past two years director of planning research, has been named director of research administration. Walter J. King Jr. succeeds Mr. Direnga as director of planning research. He previously served as assistant director, a post being assumed by Charles D. Boyer Jr., formerly manager of engineering research.

### Pesticide Danger Doubted

A panel of specialists of the American Public Health Association meeting in San Francisco, Nov. 1, agreed that the present hazard in using pesticides on food crops lies primarily in accidental poisoning by those using the chemicals. The dangers of eating foods with a residue of pesticide is very slight now, in the opinion of participants in the symposium. This view might change, however, it was suggested, as more evidence is reported on the use of pesticides.

The panel was under the chairmanship of Dr. Irma West of

the California Department of Public Health. Members included: Dr. William M. Upholt, U. S. Public Health Service; Dr. Harold H. Golz, American Cyanamid Co.; Dr. Mitchell R. Zavon, U. of Cincinnati College of Medicine; Dr. Howard M. Cann, Stanford University Medical School; and John T. Wilson, Santa Clara County (Calif.) Health Department. The panel said that accidental poisoning of workers using pesticides or of children who accidentally swallow them is the major problem. All agreed that pesticide residues now reaching the American table are at so low a level it is hard to see how they could be harmful.

### Two Named By Sohio

George L. McGuffey has been appointed sales manager of national accounts in the agricultural section of the Sohio Chemical Co., Lima, Ohio, and Harrold W. Goodnight was named district sales manager in charge of agricultural sales west of the Mississippi River.

Mr. McGuffey joined Sohio's chemical department in 1955. Mr. Goodnight joined Sohio in 1939.

### Texas Gulf To Build Potash Facility In Utah

TEXAS Gulf Sulphur Co., New York, will erect a \$25 million potash mining and processing plant in southeastern Utah.

Directors of the company have authorized the exercise of an option to acquire extensive potash reserves at Cane Creek, Utah, near the town of Moab.

The company previously disclosed that a core drilling program in the Cane Creek area had confirmed a very large potash deposit believed to be richer than any known to exist in the United States. The new plant is designed to produce a million tons of muriate of potash annually. This will make Texas Gulf the largest potash producer in the country. If construction schedules are maintained, the company expects to have potash in the market by about the end of 1962.

### OK Lethane For Cattle

Residue tests conducted by Rohm & Haas Co., Philadelphia, have been accepted by the U. S. Department of Agriculture as satisfactory evidence that Lethane thiocyanate compound may be used for the control of such insects as hornflies, stable flies, mosquitoes, and gnats on dairy cattle, on a no-residue basis.

The conditions of use specified by the USDA are as follow: "Not more than 1/2 ounce of a 3.5 per cent spray (6% Lethane 384 by volume) per adult animal twice daily. Apply evenly over upper neck, back, and rump. Do not wet hide. Avoid spraying udders, eyes, mouth, feed or drinking troughs; or milk buckets and equipment directly contacting milk."

Lethane also may be used on beef cattle and hogs.

### Ralph Wechsler Retires

Ralph Wechsler, chairman of the board of Nopco Chemical Co., Newark, N. J., was honored recently at a testimonial dinner marking his retirement from the company after almost 40 years of service.

The initial mine shaft will have a depth of about 2,700 feet and a diameter in the order of 20 feet. This is larger than initially planned and will enable the company later to supply ore adequate for an expanded plant. The company states that, by the end of 1963, capacity of the new plant may be raised to well over 1,500,000 tons of commercial output annually. The company believes that such expansion of capacity may well be warranted by the growth in demand for potash.

With the exercise of the option by TGS, Delhi-Taylor will retain a net profit interest in the potash properties, and will receive advance net profit payments of \$4,500,000 over a four-and-one-half year period. A first payment of \$500,000 has been received by Delhi-Taylor.

AGRICULTURAL CHEMICALS



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## TALE ENDS

**T**HE idea that "light traps" are really effective in insect control was branded as an illusion recently by Iowa State Univ. entomologist Harold Gunderson. Gunderson said that a propaganda drive to push light traps is currently under way in the state, but experience of trained researchers indicates that the traps are ineffective in corn borer control. It just isn't possible, in years when the moth population is high, for traps to catch enough corn borer moths to do any good. In some

tests, more corn-borer eggs were laid in fields where light traps were in operation than in fields without them. The traps apparently attracted hordes of moths, and then failed to catch them.

AC

Perhaps the science of entomology needs improved press agency, we felt, as we spotted the accompanying panel in one of our favorite "comics". Is the profession so little known that it is necessary to define the word "entomologist",

## THE PHANTOM



or is it simply that readers of comic strips must be assumed to be so illiterate? We see that cartoonist Lee Falk presents his entomologist in the approved long-haired, wisp-over-the-ear fashion. At least this hair style is superior to that affected by all the chemists we have ever seen, who have the clippers run way up the sides so the dandruff won't drop in the experiments. But where is the conventional butterfly net?

AC

It made us very unhappy not to be able to accept the kind invitation of the Mexican Association of Insecticide and Fertilizer Manufacturers to attend their annual meeting in Merida, Yucatan, Mexico. Incidentally, the meeting, originally scheduled for November, had to be postponed to December 5th because employees of the only plane company serving Merida went on strike.

AC

Another new, all-purpose, wonder garden product has recently been announced by K. C. Mattson Co., El Monte, Calif. Called "King Fish," it is described as a liquid organic (from fish) which produces outstanding root structures and healthier plants.

AC

One of the attractions in the exhibit area at the Fertilizer Solutions meeting held last month was "Miss Arcadian" pictured here for your approval.



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